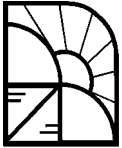


EXHIBIT A



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PHOENIX CENTER POLICY BULLETIN No. 5

9 July 2003

COMPETITION AND BELL COMPANY INVESTMENT IN TELECOMMUNICATIONS PLANT: THE EFFECTS OF UNE-P

Summary of Findings: After a brief discussion on expected and actual investment behavior in the telecommunications industry after the 1996 Act, an econometric model is used to quantify the relationship between UNE-P competition and Bell Operating Company investments in telecommunications plant. Using publicly-available Federal Communications Commission data, a positive relationship between UNE-P competition and BOC average net investment is found. According to the model, each UNE-P access line increased BOC average net investment by \$759 per year, or about 6.4% per year in the aggregate. While BOC net investment fell by about 7% in 2002, investment dollars were more heavily allocated to states with greater levels of UNE-P competition, and this additional investment offsets the total decline in investment by about 50%.

I. Introduction: Bell Company Investment Post-1996 Act

PHOENIX CENTER POLICY BULLETIN No. 4 examined the Telecommunications Act of 1996's general effect on investment by telecommunications firms. Using publicly-available government data on investment by telecommunications firms, that BULLETIN quantified the substantial and sustained increases in investment by telecommunications firms immediately following the 1996 Act and continuing through 2001 (the last year for which data was available).¹ The statistics reported in that BULLETIN indicated that the 1996 Act led to an additional \$267 billion in telecommunications investment from 1996 through 2001. Equally as

¹ PHOENIX CENTER POLICY BULLETIN No. 4: *The Truth About Telecommunications Investment* (24 June 2003) (available at <http://www.phoenix-center.org/PolicyBulletin/PolicyBulletin4Final.pdf>). According to the BEA webpage, it expects to release 2002 data around September 2003.

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5335 Wisconsin Avenue, NW, Suite 440

Washington, D.C. 20015

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important, PHOENIX CENTER POLICY BULLETIN NO. 4 demonstrated that the capital stock for this time period also grew rapidly with net capital-stock exceeding historical trend by nearly \$200 billion at the end of 2001.² The evidence presented in that BULLETIN clearly is consistent with the hypothesis that the 1996 Act increased capital spending in the telecoms sector. As the U.S. Supreme Court recognized: it “suffices to say that a regulatory scheme [*i.e.*, requiring monopoly incumbents to unbundle key elements of their network at their Total Element Long-Run Incremental Costs or “TELRIC”] that can boast such substantial competitive capital spending over a 4-year period is not easily described as an unreasonable way to promote competitive investment in facilities.”³

² *Id.*

³ *Verizon v. FCC*, 122 S. Ct. 1646, 1675-76 (2002). Since the FCC’s adoption of TELRIC, the Bell Companies have presented a wide variety of objections, ranging from the full gamut from TELRIC produces confiscatory (*i.e.*, below-cost rates that constitute an improper “takings” under the Constitution) to lack of profitability to just plain unfairness. See, *e.g.*, *In the Matter of Petition for Forbearance From the Current Pricing Rules for the Unbundled Network Element Platform, Petition For Expedited Forbearance of the Verizon Telephone Companies* (filed 1 July 2003). Unfortunately for the Bells, however, such a claim is supported neither by the law, economics or facts. To wit, the Court in *Verizon* expressly found that, among other things: (1) the Bells are monopolists and, as such, Congress intended to treat them differently and impose asymmetrical regulation to mitigate their market power; (2) “Convergence” of networks (*i.e.*, so called “inter-modal” competition”) is ephemeral at best, and consumers generally do not view other distribution technologies as close substitutes for the Bells’ local access networks; (3) BOC sabotage against their rivals for wholesale “last mile” access remains real and must be addressed; (4) Because the local market is far from competitive (just as when the Bell system was first broken up), the BOCs today can still leverage their market power in the last mile into the ancillary markets such as long distance, terminal equipment and data; and (5) Rivals who enter via unbundled network elements are *not* “parasitic competitors” and that any notion that TELRIC stymies facilities-based competition “founders on fact.” For a full discussion of the *Verizon* Opinion and the current FCC broadband initiatives, see Lawrence J. Spiwak, *The Telecoms Twilight Zone: Navigating the Legal Morass Among the Supreme Court, the D.C. Circuit and the Federal Communications Commission*, PHOENIX CENTER POLICY PAPER SERIES NO. 13 (August 2002) (<http://www.phoenix-center.org/pcpp/PCPP13Final.pdf>); COMMUNICATIONS WEEK INTERNATIONAL, *Opinion: U.S. Competition Policy – The Four Horsemen of the Broadband Apocalypse* (01 April 2002) (available at <http://www.phoenix-center.org/commentaries/CWHorsemen.pdf>).

Moreover, the record simply does not support the BOCs’ position. PHOENIX CENTER POLICY PAPER NO. 16 reveals that the States have been extremely careful to ensure that TELRIC rates accurately reflect the Bells’ forward looking costs. Moreover, the States have actually preserved some BOC profit in a politically-sensible “50/50” split between the desired outcomes of new entrants and the incumbents. Accordingly, the fact that BOC margins are declining is an intended consequence of the Telecommunications Act 1996 and a rational public policy that, deliberately, does not incorporate the monopoly rents the Bells have traditionally enjoyed in the wholesale prices for unbundled network elements. T. Randolph Beard and George S. Ford, *What Determines Wholesale Prices for Network Elements in Telephony? An Econometric Evaluation*, PHOENIX CENTER POLICY PAPER NO. 16 (September 2002) (<http://www.phoenix-center.org/pcpp/PCPP16.pdf>).

Similarly, the BOCs’ argument is particularly odd under any scenario because the BOCs will lose *more money* if they lose a customer to a facilities-based competitor outright. As PHOENIX CENTER POLICY PAPER NO. 15 demonstrates, when losing a customer to a facilities-based provider, the BOCs would: (1) receive no revenue for that last line; and (Footnote Continued....)

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This BULLETIN goes beyond PHOENIX CENTER POLICY BULLETIN NO. 4 to analyze how particular pro-competitive policies of the 1996 Act have specifically affected investment by the Bell Operating Companies (“BOCs”) in telecommunications plant. In particular, this BULLETIN evaluates the impact on BOC investment of the 1996 Act’s requirement that the BOCs (and other local exchange carriers) offer to competitors the unbundled element combination of loop, switching and transport elements at TELRIC pricing, commonly referred to as Unbundled Network Element – Platform or “UNE-P.” In an effort to address this question, this BULLETIN constructs a data set of investment and related information from the Automated Reporting Management Information System (“ARMIS”). These investment data are analyzed together with the number of access lines provisioned over the UNE-Platform in each State. With these data, it is possible to specify an empirical model that measures the relationship between UNE-P competition and BOC investment.

The D.C. Circuit Court of Appeals remand in *United States Telephone Association v. FCC* requires us to measure directly and specifically the effect of UNE-P on investment rather than to speculate about the effect with unfounded assertions derived from economy- or sector-wide trends and data aggregates.⁴ Specifically, the court opined “the existence of investment of a

also (2) would continue to incur the sunk costs of building their respective networks out to that customer in the first instance. With UNE-P, however, the BOCs still receive a steady revenue stream from that line that covers their forward-looking costs of these facilities plus a reasonable rate of return. The only plausible explanation of this apparently economically irrational behavior is that the BOCs’ fully understand that facilities-based competition will be nascent for the foreseeable future and, as such, eliminating UNE-P virtually assures the BOCs’ ability to recover monopoly rents from their dominance of the “last mile.” See George S. Ford, *A Fox in the Hen House: An Evaluation of Bell Company Proposals to Eliminate their Monopoly Position in Local Telecommunications Markets*, PHOENIX CENTER POLICY PAPER NO. 15 (September 2002) (<http://www.phoenix-center.org/pcpp/PCPP15%20Final.pdf>); see also Thomas W. Hazlett & George S. Ford, *The Fallacy of Regulatory Symmetry: An Economic Analysis of the “Level Playing Field,”* in *Cable TV Franchising Statutes*, 3 BUSINESS AND POLITICS 21 (2001) (available for download at: <http://www.egroupassociates.com/Reports/fallacy.pdf>) (incumbents understand all too well the economics of facilities-based entry, and therefore “strategically compete in the political realm to create legislation that protects rents of established operators”).

Finally, PHOENIX CENTER POLICY PAPER NO. 17 finds that the Bells are, in fact, profitable wholesale suppliers of unbundled network elements as required by the 1996 Telecommunications Act. T. Randolph Beard and Christopher C. Klein, *Bell Companies as Profitable Wholesale Firms: The Financial Implications of UNE-P*, PHOENIX CENTER POLICY PAPER NO. 17 (November 2002) (<http://www.phoenix-center.org/pcpp/PCPP17Final.pdf>). Specifically, PHOENIX CENTER POLICY PAPER NO. 17 estimates that: (a) wholesale operating costs are about \$10 per line across the BOCs; (b) EBITDA (earnings before interest, taxes, depreciation and amortization) margins are positive and average over \$14 per line per month; and (c) operating margins (or EBIT, earning before interests and taxes) are also positive, and average 40% of revenues.

⁴ 290 F.3d 415 (D.C. Cir. 2002), *cert. denied sub nom.* 123 S.Ct. 1571 (2003). For a particularly bold example of unfounded assertions, see S. B. Pociask, *The Effects of Bargain Wholesale Prices on Local Telephone Competition: Does Helping Competitors Help Consumers?*, New Millennium Research Council and Competitive Enterprise Institute (June 2003) (“Assuming half of the [economy wide] decline in [IT] investment was the result of UNE-P regulation (at 20”).

(Footnote Continued....)

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specified level tells us little or nothing about incentive effects. The question is how such investment compares with what would have occurred in the absence of the prospect of unbundling, an issue on which the record appears silent.”⁵ A precise assessment of incentives, the court stated, is best determined by “multiple regression analyses.”⁶ This BULLETIN provides such regression analysis, as did POLICY BULLETIN NO. 4, and shows that UNE-P contributes positively to BOC investment.

This BULLETIN reaches several findings:

- Our empirical analysis indicates that competition from UNE-P *does affect* BOC investment. Specifically, the BOCs invest significantly more in states where UNE-P competition is further developed.⁷ This finding conflicts with empirically unsupported analyses regarding the negative effects of UNE-P on BOC investment.⁸ While poor economic conditions are curtailing investment in most sectors of the economy including telecommunications, the specific effect of UNE-P on investment is positive.⁹
- Other forms of competitive entry, such as UNE-L and Total Service Resale, are found to have no statistically significant effect on BOC investment.
- The patterns of telecommunications investment and capital stock observed over the past few years are entirely consistent with expectations and with the hypothesis that the 1996 Act increased investment.
- Despite claims to the contrary, BOC Total Plant in Service continues to rise.

Pociask fails to account for the fact that IT investment by telecommunications firms represents only 15.6% of total IT investment. Incorporating this fact into his calculations, the alleged \$101 per household harm caused by UNE-P is reduced to \$15.75.

⁵ *Id.* at 425 (citations omitted).

⁶ *Id.*

⁷ For our sample, the total change in net investment between 2002 and 2001 was -\$648 million, whereas total net investment in 2001 was \$8.8 billion.⁴

⁸ See, e.g., Pociask, *supra* n. 4; J. A. Eisenach and T. M. Lenard, *Telecom Deregulation and the Economy: The Impact of UNE-P on Jobs, Investment and Growth*, Progress & Freedom Foundation, PROGRESS ON POINT, RELEASE 10.3 (Jan. 03); J. Eisner and D. Lehman, *Regulatory Behavior and Competitive Entry* (June 2001). These studies assume rather than test whether UNE-P has affected investment.

⁹ See PHOENIX CENTER POLICY BULLETIN NO. 4, *supra* n. 1; R. O. Beil, G. S. Ford, and J. D. Jackson, *On the Relationship between Telecommunications Investment and Economic Growth in the United States* (June 2003) (www.telepolicy.com).

Combined with the findings from POLICY BULLETIN NO. 4 and other papers evaluating econometrically the relationship between unbundling and investment, including Ford and Pelcovits (2002), Beard *et al.* (2002a, 2002b, 2002c), Willig *et al.* (2002), and Hassett and Kotlikoff (2002), the empirical evidence is mounting against the oft-repeated claim that the unbundling policies of the 1996 Act reduce investment by both incumbents and entrants.¹⁰ Ford and Pelcovits (2002) show, using two separate econometric tests motivated by the economic theory of entry, that facilities-based entry is higher in states with lower unbundled element prices. This finding suggests a complementary relationship between UNE and facilities-based entry. Beard, Ford and Koutsy (2002a) provide a theoretical analysis of why a complementary relationship exists, and their empirical analysis of CLEC switch deployment indicates that the complementary relationship between unbundling and facilities-based entry is larger than the substitution relationship advocated by the BOCs. A recent paper by Beard, Ford and Ekelund (2002b), in addition to providing an insightful economic definition of the impairment standard of the 1996 Act's section 251(d)(2)(B), present econometric evidence showing that self-supplied and unbundled switching are not effective substitutes, implying the two forms of switching are used to serve different markets. Beard and Ford (2002c) provide supporting evidence of the same proposition. Willig *et al.* (2002) use a panel dataset to evaluate the relationship between unbundling and investment, and find a positive link between the two. Using a simulation analysis based on a theoretical model, Hassett *et al.* (2002) illustrate how competitive entry in telecommunications markets improves economic performance.

To date, there is no reliable econometric evidence of which we are aware that indicates unbundling discourages investment by either the BOCs or CLECs, or otherwise has any negative impact on economic performance in the telecommunications industry.¹¹ However, the

¹⁰ See G. S. Ford and M. D. Pelcovits, *Unbundling and Facilities-Based Entry by CLECs: Two Empirical Tests* (July 2002): www.telepolicy.com; T. R. Beard, R. B. Ekelund Jr., and G.S. Ford, *Pursuing Competition in Local Telephony: The Law and Economics of Unbundling and Impairment* (November 2002): www.telepolicy.com; T. R. Beard, G. S. Ford, and T.M. Koutsy, *Mandated Access and the Make-or-Buy Decision: The Case of Local Telecommunications Competition* (December 2002): www.telepolicy.com; R. D. Willig, W. H. Lehr, J. P. Bigelow, and S. B. Levinson, *Stimulating Investment and the Telecommunications Act of 1996*, Unpublished Manuscript (October 2002); K A. Hassett and L. J. Kotlikoff, *The Role of Competition in Stimulating Telecom Investment*, AEI PUBLICATION (October 2, 2002) (www.aei.org/publications/pubID.14873/pub_detail.asp). Hassett *et al.* (2002) perform a simulation rather than using actual data. See also, *Does Unbundling Really Discourage Facilities-Based Entry? An Econometric Examination of the Unbundled Local Switching Restriction*, Z-Tel Policy Paper No. 4 (February 2002): www.telepolicy.com.

¹¹ Filed on behalf of Qwest in the FCC's Triennial Review proceeding, Strategic Policy Research (a consulting firm) presented econometric evidence for which they claimed showed that low unbundled loop rates reduce BOC investment. However, their finding was found to be very sensitive to model specification, with a contradictory results arising from a minor modification to the empirical model. See Letter to Mr. William Maher from T.M. Koutsy and G.S. Ford, Z-Tel Communications, CC Docket No. 01-338, Oct. 7, 2002 ("SPR's analysis is not robust, in that the model produces conflicting results with only minor modifications to specification (at 16).")

competition facilitated by unbundling has been shown to lead to substantial price declines and innovation in telecommunications markets.¹²

II. How Should the 1996 Act Affect Investment by Telecommunication Firms?

Notwithstanding the compelling evidence provided by government statistics on investment by telecommunications firms, some continue to argue that the 1996 Act still failed because investment in the sector has tapered off in the past few quarters.¹³ Such simple thinking ignores the basic relationship between the capital stock and investment. Serving the demand of a particular market requires a given capital stock, which represents all assets used to produce goods and services to consumers. Investment represents additions to this capital stock, whereas depreciation represents subtractions from it. Constructing a network requires substantial investment in the early years as the required capital stock of the entrant is developed. Once

¹² See the “Projected Savings ...” reports published by Telecommunications Research and Action Center (TRAC) in 2001-2002 (www.trac.org/publications); Comptel’s Consumer Savings Analysis, January 2003 (www.comptel.org); Y. M. Braunstein, *The Role of UNE-P in Vertically Integrated Telephone Networks: Ensuring Healthy and Competitive Local, Long-Distance and DSL Markets*, Working Paper, University of California-Berkeley (May 2003); www.sims.berkeley.edu/~bigyale/UNE/index.html; L. L. Selwyn and S. M. Gately, *Business Telecom Consumers Benefit from UNE-P Based Competition*, Unpublished Manuscript (Dec. 2002); *UNE-P Saves Businesses \$6 Billion*, THE DIGEST (January 27, 2003). A recent report by the Consumer Federal of America (<http://www.consumersunion.org/telecom/teledc201.htm>) describes the benefits of competition in New York State:

As a result of genuinely open markets, consumers in New York have switched companies in droves (2 million local and 1.5 million long distance). Companies have engaged in ‘tit-for-tat’ competition, matching each other’s offers. Prices for both local and long distance service have dropped substantially (approximately 20 percent for those who shop).

Frequent Bell Company witness and former Chief Economist of the FCC attributes the diffusion of DSL to the consumer market as a direct consequence of unbundling:

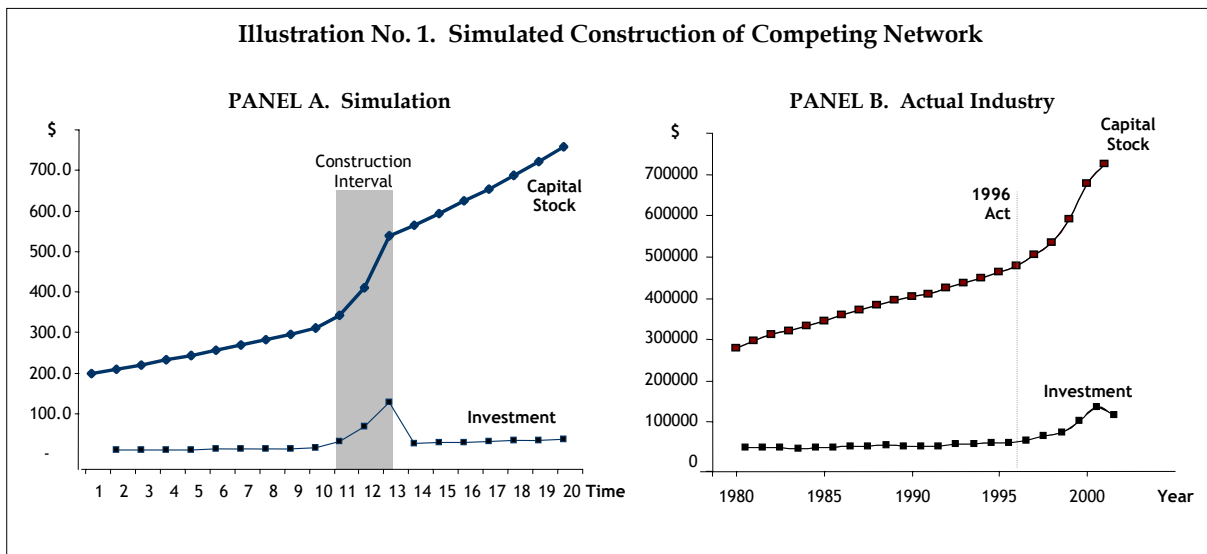
In the case of DSL, the technology was not deployed at all to provide retail, high-speed data services when local exchange companies had regional monopolies. ... Carriers did not offer DSL service as a consumer product on its own until late in 1996. That year, the Telecommunications Act of 1996 (“the Act”) opened the local telephone market to competition. The Act required incumbent telephone companies to lease out elements of their systems for competitors to use to provide service. New entrants were then able to lease copper “loops” that link central offices to customers, install their own DSL equipment and connections to the internet, and offer high-speed data service to customers that was cheaper and easier to obtain than T1 service.

H. A. Shelanski, *Competition & Deployment of New Technology in U.S. Telecommunications*, U. CHI. LEGAL F. 85 (2000).

¹³ See COMMUNICATIONS DAILY, *Telecom Investment Soared After the 1996 Act* (25 June 2003) (According to the United States Telephone Association, PHOENIX CENTER POLICY BULLETIN NO. 4 “conveniently stops at 2001,” when industry spending began slowing down: “As everyone who follows telecom knows, over the last 18 months, this sector has been extremely challenged and capital expenditures are down significantly.”)

construction is complete, investment slows down considerably as the network need only be maintained and extended in relatively limited circumstances. A sensible expectation of the effects of the 1996 Act on investment is, therefore, an immediate rise in investment and capital stock and the eventual decline in investment once new network construction nears completion, with capital stock remaining substantially above pre-Act levels.

Illustration No. 1, Panel A, below demonstrates this point by graphing the results of a simple simulation, where an entrant replicates a monopoly network. For the simulation, the following is assumed: (a) a monopoly network serves the entire customer base (100 units, growing at 5% annually) for periods 1 through 10; (b) the capital stock required to serve the customer base is \$1 per unit of total market (*i.e.*, homes passed) plus \$1 per unit sold; (c) the entrant constructs a network in periods 11 through 12 capable of serving the entire market (passing 10% of homes in the first year, 40% the second year, and all homes during the third year); d) the entrant has 5% market share the first year, 25% the second year, and 50% for the remainder of the simulation. Illustration No. 1, Panel A, illustrates both the capital stock and investment (for both incumbent and entrant) from this simulation. This simple simulation establishes reasonable expectations about how investment and capital stock should change when entry is allowed in a monopolistic market.



For years 1 through 10, the capital stock rises 5% annually as the network grows with the customer base (5% annually). Investment is simply the difference in the capital stock between years (*i.e.*, there is no depreciation for simplicity). In year 11, the entrant begins constructing its network; note the rise in both capital stock and investment. This construction continues in years 12 and 13 with capital stock and investment rising sharply. In year 14, the entrant's construction is complete and investment plummets; future growth now is related only to the

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growth in the size of the market (total units sold grows 5% annually, of which the entrant gets half). The capital stock is now (about) twice its monopolistic level.¹⁴ Thus, it is the capital stock and not investment that serves as a better indicator of the effects on investment of a “pro-entry” regulatory agenda.¹⁵

Now, compare Panel A and Panel B in Illustration No. 1, the latter illustrating actual capital stock and investment by telecommunications firms in the U.S. over the period 1980 through 2001.¹⁶ The similarity between the illustrated trends in capital stock and investment is as undeniable as it is expected. After the 1996 Act, the capital stock and investment levels of telecommunications firms began rising sharply. In 2001, investment declined, indicating that the capital stock was leveling off at its new “equilibrium” level (about \$200 billion above what would be expected in 2001 based on historical investment).¹⁷ Therefore, the decline in investment in 2001 through today is entirely consistent with expectations following the 1996 Act, and no cause for alarm.

Reductions in investment levels following an unprecedented rise in capital stock are required; the combination of events is entirely consistent with an effective pro-competitive agenda. Importantly, other things affect investment as well, including the sluggish economy experienced in the U.S. over the past few years.¹⁸ Additionally, if facilities-based competition is as widespread as the BOCs assert, then BOC investment should be declining. After all, the BOC networks were required to serve the entire telecommunications local exchange and access demand prior to the 1996 Act, but now demand is shared among multiple carriers. Thus, by

¹⁴ Importantly, it is not clear that such replication is socially desirable. If one firm can serve the entire demand most efficiently, then replicating the network may be undesirable. Of course, the effect on output price and the efficiency with which the incumbent operates as a monopolist cannot be ignored in such an analysis. See G. Mankiw and M. Whinston, *Free Entry and Social Inefficiency*, RAND JOURNAL OF ECONOMICS, 17, Spring 1986, 48-58.

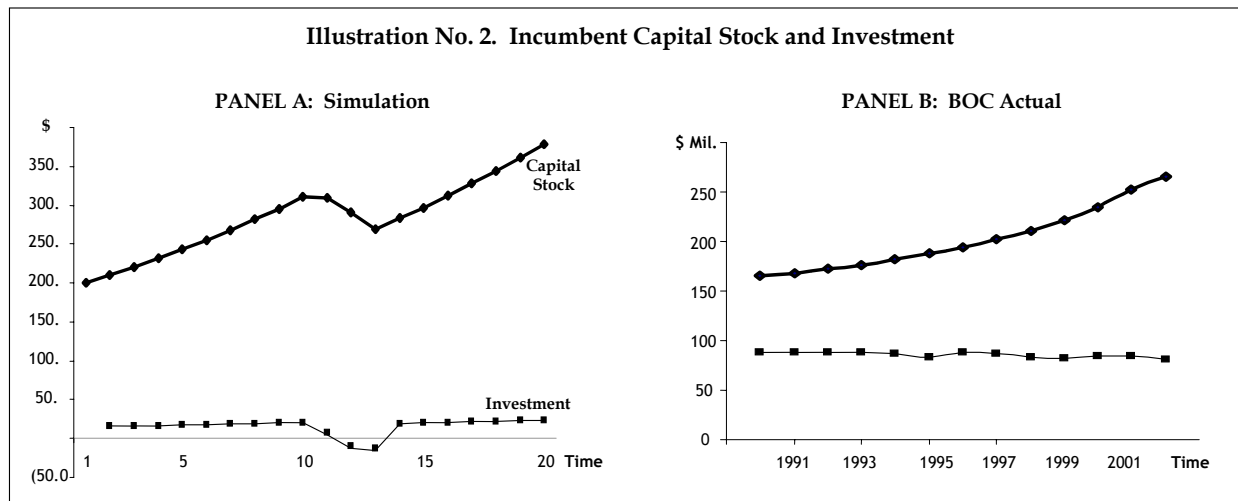
¹⁵ If entrants over-invest (perhaps due to misjudging their future market share), then capital stock may actually decline until it reaches a level consistent with the entrant’s market share. Given rampant failure of facilities-based CLECs, a decline in total capital stock in the telecom industry is to be expected.

¹⁶ This figure uses the same data as POLICY BULLETIN NO. 4.

¹⁷ See PHOENIX CENTER POLICY BULLETIN NO. 4, *supra* n. 1.

¹⁸ Beil *et al.*, *supra* n. 9 (2003) show that investment by telecommunications firms is caused by economic growth (but not vice versa). Some research suggests information technology (“IT”) investment contributes positively to Gross Domestic Product and productivity, but these studies do not focus solely on investment by telecommunications firms nor test for causality (just correlation). See, e.g., D. W. Jorgenson, *Information Technology and the U.S. Economy*, 91 AMERICAN ECONOMIC REVIEW 1-32 (2001) and S. D. Oliner and D. E. Sichel, *The Resurgence of Growth in the Late 1990s: Is Information Technology the Story?*, 14 JOURNAL OF ECONOMIC PERSPECTIVES 3-22 (2000). Investment by telecommunications firms represents only 16% of total IT investment (based on BEA data). Oliner and Sichel (2000) show that investment in information technology (IT), such as computer hardware and software, has a substantially stronger correlation with economic growth than investment in communications equipment.

definition, BOC investment should be lower today than in previous years. For the simulation, the decline in the incumbent's capital stock and investment is illustrated in Illustration No. 2, Panel A.¹⁹ In Panel B, actual BOC Total Plant in Service ("TPIS") and Average Net Investment are illustrated (Qwest data for 2002 is unavailable, so the data is BellSouth, SBC, and Verizon only). The steady rise in TPIS and relatively flat Average Net Investment suggests that facilities-based competition is relatively limited in local exchange markets today, since no substantial decline in either capital stock or investment is observed. Further, Average Net Investment declines in six of the last twelve years, suggesting reduction in net investment is neither a rare nor a new phenomenon. Despite BOC claims, no decline in TPIS has occurred since the 1996 Act, so the local exchange telecommunications plant remains intact and continues to grow.



Further, aggregate investment levels depend not only on the quantity of assets purchased, but the price at which such assets are acquired. If there truly is as much excess (*i.e.*, underutilized) capacity of sunk assets in the market as some claim, then – as the FCC itself

¹⁹ The negative investment levels can be viewed as plant retirements.

concedes – investment should also logically decline as firms can acquire assets far cheaper at bankruptcy fire sales than buy building new networks from scratch.²⁰

Further, and perhaps most importantly, reductions in investment are not *per se* undesirable. Economic performance in an industry is improved when industry output is produced with lower quantities of capital and/or labor. If output in the telecommunications industry rises or is constant and this output is produced with less investment, then society is probably better off for it.²¹ *Accordingly, investment itself is not a valid policy goal; economic performance is the proper standard for measuring the success or failures of particular policies.*

These aggregate statistics are no doubt interesting, but do not allow us to measure the effect of particular competition policies on investment. In the next section, we combine less aggregated data with an econometric model to quantify the effect of UNE-P on BOC investment. Unlike the unsupported claims by the BOCs (and their advocates) that UNE-P causes all ills in telecommunications, the data indicate that UNE-P increases BOC investment by a significant amount.

III. Bell Company Investment in Response to UNE-P

This analysis begins by constructing a dataset with state-level investment data provided by ARMIS and UNE-P line data from the FCC's Form 477 (years 2000, 2001 and 2002).²² ARMIS does not currently provide 2002 investment data for Qwest, so the analysis is restricted to BellSouth, SBC, and Verizon states (excluding the former GTE states). Excluding Qwest from the analysis, while necessary, is also desirable, since that the company is in exceedingly poor financial health relative to its BOC colleagues.²³ Further, there is very little UNE-P competition in the Qwest region (only 4.9% of UNE-P lines, but 11% of total access lines). Merging ARMIS

²⁰ See, e.g., *In re Implementation of Local Competition in Telecommunications Act of 1996*, First Report and Order, 11 FCC Rcd 15499 (1996) at ¶ 688; *In re Access Charge Reform*, Fifth Report and Order and Further Notice of Proposed Rulemaking, ___ FCC Rcd ___, FCC 99-206 (rel. 27 Aug. 1999) at ¶ 80.

²¹ Relative efficiency requires information as to whether other less productive inputs are being substituted for capital (e.g., labor).

²² ARMIS data is available at the FCC's website free of charge (www.fcc.gov/wcb/armis). Investment is from ARMIS Form 43-01 (Subject to Separations, Total Operating Revenues and Average Net Investment). UNE-P lines are measured as of June of each year.

²³ See, e.g., A. Bryer, *Qwest Indictments Capped Year-long Troubles at Telco*, Denver Business Journal (March 3, 2003): www.bizjournals.com/denver/stories/2003/03/03/story2.html; *Qwest Posts \$1.14B 2Q Loss*, CNN/Money (August 8, 2002) (money.cnn.com/2002/08/08/news/companies/qwest/); *Nacchio out at Qwest*, CNN/Money (June 17, 2002) (money.cnn.com/2002/06/17/news/ceos/qwest/). Even Qwest describes its accounting practices as "questionable." See *Qwest Gets More Time to Finish Audits*, TR DAILY (July 1, 2003).

with Form 477 data renders a dataset consisting of 52 observations, which is more than adequate for econometric analysis and traditional hypothesis testing.

Turning to the empirical model, assume that the BOC's net investment in state i at time t (K_{it}) is a function of market size (R_{it}), the amount of UNE-P competition (U_{it}), time-variant factors that are identical across states such as the cost of capital (Z_i), and state specific factors that are constant over short periods of time such as state tax rates (X_i). (To avoid unnecessary notation, assume there is a single Z and X .) Symbolically, we have the regression function

$$K_{i,t} = \beta_t + \alpha_1 R_{i,t} + \alpha_2 U_{i,t} + \alpha_3 Z_i + \alpha_4 X_i + \varepsilon \quad (1)$$

where ε is a well-behaved econometric disturbance term and the β and α are estimated coefficients. In Equation (1), a linear functional form is assumed and the coefficients (α) are assumed to be constant over short-intervals of time, but β is allowed to vary.²⁴ Rewriting Equation (1) as a first-difference equation, we have:

$$\Delta K = \Delta\beta + \alpha_1 \Delta R + \alpha_2 \Delta U + \alpha_3 \Delta Z + \Delta\varepsilon \quad (2)$$

where Δ indicates a first difference, $\Delta\beta (= \beta_t - \beta_{t-1})$ is the constant term of regression, and the error term is well-behaved (as are its components, the $\varepsilon_{i,t}$).²⁵ Since X_i is time invariant, the coefficient α_4 from Equation (1) is eliminated by subtraction.

From Equation (2), the coefficient on ΔR (α_1) measures the influence of the BOC's market size on its net investment, and the expectation is that α_1 will be positive. For our model, market size is measured by BOC total operating revenues in the state. The coefficient on ΔU (α_2) is of primary interest because it measures the influence of UNE-P competition on BOC net investment. If UNE-P competition increases net investment in plant, then α_2 will be positive; alternately, if UNE-P competition reduces net investment in plant, then α_2 will be negative. We make no *a priori* expectation with respect to α_2 , allowing the data to inform us as to the relationship between UNE-P and net investment. Finally, the variable Z takes the form of a dummy variable that equals 1 for the second period (2001 to 2002), 0 otherwise. This dummy variable captures the effect of any change in all other relevant factors between the periods that do not vary by state (interest rates, etc).

²⁴ Allowing β to vary lets the average change in net investment differ between periods.

²⁵ See J. M. Wooldridge, *ECONOMETRIC ANALYSIS OF CROSS SECTION AND PANEL DATA 2002*, Section 10.6.

The least squares estimates of Equation (2) are summarized in Table 1. Model 1 expresses the variables in levels, whereas Model 2 expresses the variables ΔK , ΔR , and ΔU on a per-access line basis.²⁶ Model specification tests (White and RESET) indicate Model 2 is better specified, passing both tests easily.²⁷ Thus, discussion of the results will be limited to Model 2 (unless otherwise stated). Given the parsimonious and linear specification of Equation (2), the inability to reject the null hypothesis of the RESET test is encouraging, since RESET, while a rather general specification test, is highly effective at detecting omitted variables and incorrect functional form.²⁸ As illustrated in Table 1, the results between the two models are not much different for the coefficient of interest (ΔU , α_2), though the coefficient in Model 2 is smaller than Model 1. (The difference in the coefficients for $\Delta\beta$ and ΔZ is caused by the scaling of the dependent variable.)

Table 1. Summary of Results		
Variable	Model 1	Model 2
$\Delta\beta$	-1.3E+07 (0.20)	-13.34 (-1.21)
ΔR (α_1)	0.92 (2.53)*	0.42 (1.49)
ΔU (α_2)	815.6 (2.77)*	759.1 (2.55)*
ΔZ (α_3)	-1.9+08 (-2.07)*	-70.94 (-4.46)*
R ²	0.33	0.48
White χ^2	18.58*	0.81
RESET	20.10*	0.13

* Statistically significant at the 5% level or better.
 ** Statistically significant at the 10% level or better.

Both Models 1 and 2 exhibit good statistical significance, with nearly 50% of the total variation in BOC net investment explained by Model 2. The constant term ($\Delta\beta$) is statistically

²⁶ Total access lines are provided by Form 477.

²⁷ The null hypothesis of the White test is “homoscedastic disturbances” and the null of RESET is “no specification error.” Ideally, neither hypothesis would be rejected and neither is for Model 2, but both nulls are rejected for Model 1. For a description of these tests, see D. N. Gujarati, 3 BASIC ECONOMETRICS 1995, at 379 and 464.

²⁸ See J. R. Thursby, *Alternative Specification Error Tests: A Comparative Study*, 74 JOURNAL OF THE AMERICAN STATISTICAL ASSOCIATION 222-225 (1979). In an alternate specification, total access lines in the state was included as a regressor to insure that the market size was not responsible for the estimated relationship between investment and UNE-P lines. The results were unchanged (for the most part), and the access lines variable was not statistically significant.

significant in Model 1 but not Model 2, which is not surprising given that the dependent variable in Model 2 is expressed on a per-line basis. The coefficient on ΔR is statistically significant in Model 1 at traditional levels, but is only significant at the 14% level in Model 2 (which is significant at the 10% level in a one-tail test, which may be appropriate given that only positive values of α_1 are expected). The estimated coefficients indicate that investment increases by about \$0.42 (Model 2) for every additional dollar of annual revenue, other things constant. In both models, the coefficients on ΔU and ΔZ (α_2 and α_3 , respectively) are statistically different from zero at traditional significance levels. The coefficient on ΔZ (α_3) is negative and highly significant.

Most importantly, the regression analysis indicates that UNE-P competition increases BOC net investment, with each UNE-P line increasing net investment by \$759 per year. In June 2002, UNE-P lines summed to about 6.8 million (in BellSouth, SBC, and Verizon regions), implying UNE-P competition translates into about \$5.2 billion in additional net investment.²⁹ (As of December 2002, UNE-P lines totaled 10.1 million across all regions.)³⁰ At the end of 2002, BOC total net investment was \$81.1 billion, so UNE-P competition increases net investment by about 6.4% (on average).³¹ While UNE-P competition is related to increased investment at the state level, this finding does not imply total investment was higher. BOC net plant grew by about 3% in 2001, but fell by 7% in 2002. However, absent UNE-P, BOC net investment would have fallen even more in 2002, with an expected total decline of about 13%. Thus, UNE-P attenuated investment declines by about 50% (= 6.4%/13%). No growth in investment would have been realized in 2001 absent UNE-P competition, based on the 4.2 million UNE-P lines in 2001 (measured in June of that year).

Quantifying the impact of alternative forms of entry – primarily UNE-L (loops purchased without switching and transport) and Total Service Resale – is accomplished by incorporating data for these forms of entry to our dataset. Adding variables for these alternate forms of entry to the analysis indicates that neither is a statistically significant determinant of BOC net investment, and we cannot reject the hypothesis that the coefficients UNE-L and Total Service Resale are jointly zero (i.e., the variables do not improve the explanatory power of the regression).³² Thus, the data indicate that UNE-L and resale do not stimulate investment by the

²⁹ The calculation assumes constant returns.

³⁰ See FCC Form 477 data and UNE-P Fact Report, January 2003 (Pace Coalition: www.pacecoalition.org).

³¹ ARMIS Form 43-01, Average Net Investment, Subject to Separations (all BOCs).

³² The models are identical to Models 1 and 2 except that UNE-L and Total Service Resale lines are included as additional regressors. A table summarizing the results is available upon request.

BOCs.³³ The coefficient for UNE-P ($\Delta U, \alpha_2$) remains statistically significant at better than the 5% level for both model specifications (Models 1 and 2). The findings are sufficiently similar that we forgo a detailed discussion of the results.

IV. Conclusion and Policy Recommendations

The empirical evidence is mounting against the claim that the pro-competitive unbundling policies of the 1996 Act have reduced investment in the telecommunications industry. In this POLICY BULLETIN, UNE-P competition is shown to positively affect BOC net investment. So, while BOC net investment may be down relative to previous years due to economic conditions and other factors, *UNE-P itself exerts a positive influence on investment*. Thus, it appears that factors other than UNE-P are fully responsible for the lower investment levels by the BOCs in 2002. In fact, UNE-P competition is shown to offset investment reductions in 2002 by about 50%. Overall, each UNE-P line increases BOC investment by about \$759 per year. Alternative forms of entry – UNE-L and Total Service Resale – are found to have no effect on BOC net investment.

Since the *USTA* decision, there has been much discussion about the costs and benefits of unbundling, with the effects of unbundling on investment receiving the most attention. The benefits of unbundling – and in particular UNE-P – are undeniable. Millions of households are now purchasing service from competitor suppliers of local telephone service and price competition in the industry is increasingly intense.³⁴ New, advanced services are being developed and deployed across the country, with UNE-P providers contributing substantially this innovation. With regard to investment, the weight of the empirical research indicates that there is nothing to fear from unbundling and UNE-P. The empirical evidence consistently shows that unbundling stimulates investment by both entrants and incumbents implying that investment and unbundling are more like complements than substitutes. We find no evidence, in our own analyses or that of others, that unbundling or UNE-P reduce investment.

Accordingly, the current cynicism, ideological bias and outright ignorance towards UNE-P and TELRIC pricing must come to an end.³⁵ Like it or not, “Congress passed a ratesetting

³³ The expected effect of UNE-L on BOC investment is ambiguous. Because UNE-L does not require switching, BOC investment in switching plant should decline. Alternately, CLEC switches typically use BOC high capacity circuits for transport and require colocation space, both of which may require BOC investment (non-recurring charges suggest investment is probably required).

³⁴ FCC Status of Local Competition Report (rel. 3 June 2003) (available at www.fcc.gov/wcb/stats).

³⁵ *Powell Expects “Triennial Review” Order To Be Released Monday*, TRDAILY (June 25, 2003) (Powell “also joked about the unbundled network element-platform (UNE-P) when discussing the popularity of wireless ‘hot spots.’ ‘Really, these hot spots are great,’ he said. ‘You just walk right up and get access for next to nothing. Sort of like (Footnote Continued....)

statute with the aim not just to balance interests between sellers and buyers, *but to reorganize markets by rendering regulated utilities' monopolies vulnerable to interlopers, even if that meant swallowing the traditional federal reluctance to intrude into local telephone markets.*"³⁶ As TELRIC does not result in confiscatory rates (if anything, they still remain on the "creamy" side in many jurisdictions³⁷), the growing push for BOC sector-specific relief (and, *a fortiori*, a decline in competitive pressures) is specious at best and raises troubling indications of regulatory capture at worst.

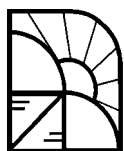
If policymakers really want to maximize consumer welfare by protecting competition and not individual competitors (*i.e.*, the BOCs), then U.S. policymakers should stop dreaming that a monopolist will change its spots and invest in new facilities if only it received relief from "pesky" competitive pressures. Instead, if policymakers focus on their core and interrelated statutory mandates – *i.e.*, (a) prevent dominant firms under their jurisdictions from exercising their market power by raising prices and restricting output; and (b) reduce entry barriers for new firms – then we might just get out of the current telecoms slump before it is too late.

UNE-P.""); Kathleen Q. Abernathy, *My View from the Doorstep of FCC Change*, 54 FED. COM. L.J. 199, 206-7 (2002) ("Excessive sharing of facilities destroys the investment incentives of both incumbents and new entrants alike: rational incumbents avoid risking capital on new facilities if rivals can get a free ride, and rational entrants will refrain from deploying their own facilities if they have unrestricted access to incumbents' networks at cost-based rates. This stifling of investment incentives is all the more problematic where supposedly "cost-based" rates are, as in some cases, based on a model that makes unrealistic economic assumptions and accordingly turn out to be *below* actual cost. In striving to stimulate *some* form of local telephone competition, by creating expansive resale and unbundling opportunities, we have adopted rules that have failed to engender, and may have actually hampered, *facilities-based* competition—which is the most viable strategy in the long term and the one most likely to benefit consumers.") (emphasis in original); James J. Cramer, *Wrong Guys Victorious at FCC Today*, THESTREET.COM (20 February 2003).

³⁶ *Verizon v. FCC*, *supra* n. 3 at 1661 (emphasis supplied).

³⁷ See PHOENIX CENTER POLICY PAPER NO. 16, *supra* n. 3.

EXHIBIT B



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PHOENIX CENTER POLICY BULLETIN NO. 4

24 June 2003

THE TRUTH ABOUT TELECOMMUNICATIONS INVESTMENT

Summary of Findings: An analysis of investment by telecommunications firms before and after the 1996 Telecommunications Act reveals substantial increases in the level of investment and capital stock for this sector following the enactment of this important legislation. There is no evidence that the 1996 Act reduced investment, and capital stock in the industry is at its historical peak. Indeed, the data shows some \$267 billion in additional investment, more than \$95.3 billion annually, in the five years following passage of 1996 Act. Despite recent declines in investment in the industry caused in part by the near total collapse of facilities-based CLECs, telecommunications investment remains well above historical levels.

I. Introduction

With the Telecommunications Act of 1996, Congress passed a statute “with the aim not just to balance interests between sellers and buyers, but to reorganize markets by rendering regulated utilities monopolies vulnerable to interlopers.”¹ Even though consumers increasingly continue to see benefits resulting from the competition produced by the 1996 Act,² reports by organizations such as the Progress and Freedom Foundation, the New Millennium Research Council, and the Competitive Enterprise Institute all blame the 1996 Act for a supposed decline in telecommunications investment.³ None of these reports, however, provide anything akin to a

¹ *Verizon v. FCC*, 122 S. Ct. 1646, 1661 (2002).

² FCC Status of Local Competition Report (rel. 3 June 2003) (available at www.fcc.gov/wcb/stats).

³ Recent examples of Bell-funded reports include S. B. Pociask, *The Effects of Bargain Wholesale Prices on Local Telephone Competition: Does Helping Competitors Help Consumers?*, New Millennium Research Council and Competitive Enterprise Institute (June 2003) and J. A. Eisenach and T. M. Lenard, *Telecom Deregulation and the Economy: The Impact of UNE-P on Jobs, Investment and Growth*, Progress & Freedom Foundation, PROGRESS ON POINT, RELEASE 10.3 (Jan. 03).

(Footnote Continued....)

PHOENIX CENTER FOR ADVANCED LEGAL & ECONOMIC PUBLIC POLICY STUDIES

5335 Wisconsin Avenue, NW, Suite 440

Washington, D.C. 20015

Tel: (+1) (202) 274-0235 Fax: (+1) (202) 244-8257 / 9342 e-Fax: (+1) (240) 250-0879

www.phoenix-center.org

thorough industry-wide analysis of the effects of the 1996 Act on investment by telecommunications firms.⁴ This POLICY BULLETIN attempts to accomplish this important task.

This Policy Bulletin employs data from the U.S. Bureau of Economic Analysis (www.bea.gov) to evaluate the effect of the 1996 Act on investment. The Bureau of Economic Analysis is responsible for collecting and presenting to the public massive amounts of economic data, including data on real investment and net capital stocks by industry sector. These detailed data can be used to evaluate the effects of the 1996 Act on the investment by (and the capital stock of) telecommunications firms. The data are available at no charge at the BEA website, and no adjustments are made to the data for this analysis.

An analysis of investment by telecommunications firms before and after the 1996 Telecommunications Act reveals substantial increases in the level of investment and capital stock for this sector following the enactment of this important legislation. There is no evidence that the 1996 Act reduced investment, and capital stock in the industry is at its historical peak. Despite recent declines in investment in the industry (caused in part by the near total collapse of facilities-based CLECs), telecommunications investment remains well above historical levels. These findings are consistent with the findings of the U.S. Supreme Court in its landmark decision of *Verizon v. FCC*, where the Court specifically held that the Bell monopolists' arguments that the 1996 Act, and TELRIC pricing in particular, does not produce new telecommunications investment patently "founders on fact."⁵ In the Court's own words, it "suffices to say that a regulatory scheme that can boast such substantial competitive capital

None of these reports contains original research related to this issue. The decline in investment is most frequently attributed to UNE rates. For a thorough analysis of UNE rates and their relation to Bell costs, see T. R. Beard and C. C. Klein, *Bell Companies as Profitable Wholesale Firms: The Economic Implications of UNE-P*, PHOENIX CENTER POLICY PAPER NO. 17 (Nov. 2002); T. R. Beard and G. S. Ford, *What Determines Wholesale Prices for Network Elements in Telephony? An Econometric Evaluation*, PHOENIX CENTER POLICY PAPER NO. 16 (Sept. 2002); and T. R. Beard, G. S. Ford, and C. C. Klein, *The Financial Implications of the UNE-Platform: A Review of the Evidence*, COMMLAW CONSPPECTUS (forthcoming Fall 2003) [papers are available at www.phoenix-center.org and www.telepolicy.com].

⁴ These studies typically rely on investment analysts' estimates and forecasts of year-to-year changes in investment by particular telecommunications firms (or groups of such firms). More importantly, these reports ignore a basic economic fundamental: absent competitive pressure, it will be a fool's errand to think that a Bell monopolist will ever on its own initiative invest in new facilities beyond those minimally necessary to ensure that quality of service obligations are barely met (and sometimes not even that). See, e.g., TR STATE NEWSWIRE, *New York – PSC Orders Audit, Suspends Pricing Flexibility for Verizon* (19 June 2003); *Qwest Sustains Service Quality Improvements but Faces \$725,000 in Potential Fines for Past Violations*, Oregon Public Service Commission Press Release 2001-008 (February 16, 2001); *Ameritech Under More Scrutiny*, THE DIGEST (Dec. 12, 2001); *Pac Bell Faces Fines*, THE DIGEST (Dec. 12, 2001); Opinion & Order, Ohio Public Service Commission 99-0938-TP-COI (July 20, 2000); Mark Harrington, *State: Verizon's Service Declining*, NEWSDAY.COM (May 23, 2003); see also, PHOENIX CENTER POLICY BULLETIN NO. 3, *The Broadband Loophole: Is Symmetrical Regulation in the Face of Asymmetrical Market Power Good Public Policy?* (19 March 2003) (<http://www.phoenix-center.org/PolicyBulletin/PolicyBulletinNo3.pdf>).

⁵ *Supra* n. 1 at 1675.

PHOENIX CENTER FOR ADVANCED LEGAL & ECONOMIC PUBLIC POLICY STUDIES

5335 Wisconsin Avenue, NW, Suite 440

Washington, D.C. 20015

Tel: (+1) (202) 274-0235 Fax: (+1) (202) 244-8257 / 9342 e-Fax: (+1) (240) 250-0879

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spending over a 4-year period is not easily described as an unreasonable way to promote competitive investment in facilities.”⁶ Equally as important, the Majority in *Verizon* found that the evidence does not support Justice Breyer’s assertion in his dissent that TELRIC will stifle incumbents’ incentive either to innovate or to invest in new elements. As both the Majority and Justice Breyer in his dissent noted, incumbent Bell monopolies have invested over \$100 billion since the passage of the 1996 Act, thus affirming “the commonsense conclusion that so long as TELRIC brings about some competition, the incumbents will continue to have incentives to invest and to improve their services to hold on to their existing customer base.”⁷

II. Analysis

Figure 1 displays real investment by telecommunications carriers between the years 1980 and 2001 (2002 data is not yet available).⁸ Plainly, investment by telecommunications firms skyrocketed after the passage of the 1996 Act.⁹ From 1980 through 1995, investment by telecommunications firms grew at an annual rate of 2.8%, with average investment level of about \$38.8 billion.¹⁰ After the 1996 Act, investment by telecommunications firm has grown at an average annual rate of 22.3%, with \$95.3 billion invested annually (on average) for a total of about \$572 billion during this time. Based on the difference between actual (\$572 billion) and forecasted levels of investment (\$305 billion), the 1996 Act is estimated to have generated \$267 billion in additional telecommunications investment from 1996 through 2001.¹¹ The government

⁶ *Id.* at 1675-76.

⁷ *Id.* at 1676, n. 33.

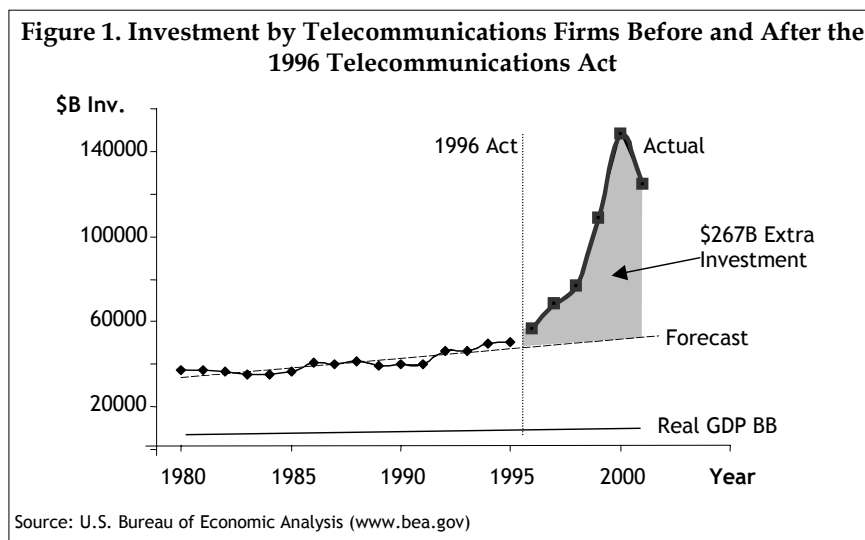
⁸ For the computation of real investment (versus nominal), the base year is 1996.

⁹ Recent econometric analysis indicates that investment by telecommunications firms *does not cause* economic growth, but *is caused by* economic growth. See R. O. Beil, G. S. Ford, and J.D. Jackson, *On the Relationship between Telecommunications Investment and Economic Growth in the United States* (June 2003) (www.telepolicy.com). Some research suggests telecommunications and/or information technology investment contributes positively to Gross Domestic Product and productivity, but these studies do not focus solely on investment by telecommunications firms and typically evaluate the effects of capital stock rather than investment. See, e.g., D. W. Jorgenson, *Information Technology and the U.S. Economy*, 91 AMERICAN ECONOMIC REVIEW 1-32 (2001) and S. D. Oliner and D. E. Sichel, *The Resurgence of Growth in the Late 1990s: Is Information Technology the Story?*, 14 JOURNAL OF ECONOMIC PERSPECTIVES 3-22 (2000). Investment by telecommunications firms represents only 16% of total IT investment (based on BEA data).

¹⁰ Piecewise regression confirms that the pre- and post-Act investment levels and growth rates are statistically different. The regression estimates pre- and post-Act growth rates of 2.8% and 22.3% (coefficients 0.028 and 0.194 with statistically significant t-statistics of 7.51 and 5.97, respectively). For a simple explanation of piecewise regression, see R. S. Pindyck and D. L. Rubinfeld, *ECONOMETRIC MODELS & ECONOMIC FORECASTS* (1991), p. 118.

¹¹ Forecast values for the post-Act period are computed using a linear time trend. If a one-period lag model with drift is used to forecast the post-Act levels of investment, the contribution of the Act to investment is \$260 billion. Alternate forecast methods do not produce meaningfully different results, since the linear trend is a good approximation of pre-Act investment levels.

data provides no support for the claim that the 1996 Act reduced investment by telecommunications firms.



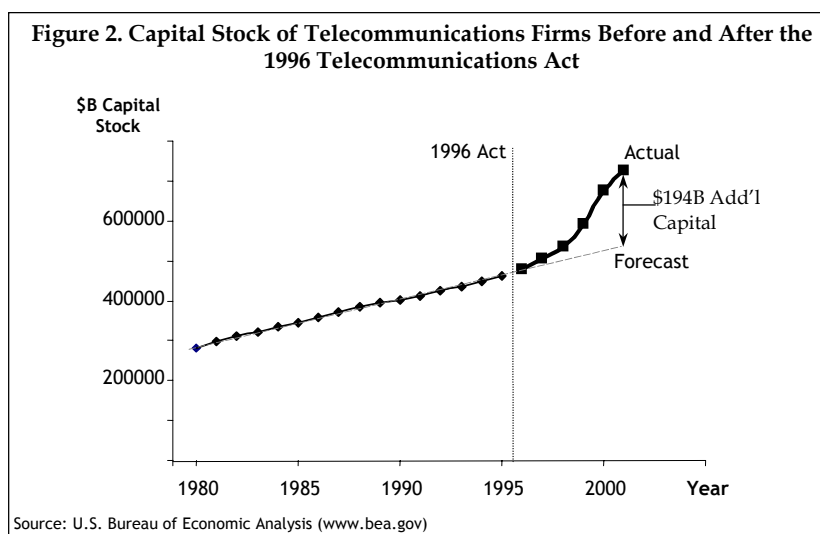
Beil *et al.* (2003) find that growth in the economy *causes* investment in the telecommunications sector (but investment by telecommunications firms *does not cause* economic growth).¹² Thus, an interesting question is whether or not higher economic growth in the post-1996 Act period explains the unprecedented rise in investment by telecommunications firms. An analysis of the growth rate of Gross Domestic Product (“GDP”) indicates that pre- and post-1996 Act GDP growth rates are not different, suggesting that economic growth is not responsible for the increase in telecommunications investment.¹³ Real GDP (in billions) is illustrated in Figure 1, and it is apparent that no dramatic shift in GDP occurs between the pre- and post-Act periods.

The increased investment in telecommunications firms following the 1996 Act naturally resulted in a rise in the (real) capital stock of telecommunications firms, as shown in Figure 2.

¹² Beil *et al.* (2003), *supra* n. 3.

¹³ GDP growth averaged about 3% over the period and growth was not statistically different between the pre- and post-Act periods. Including GDP in a regression of investment growth does not alter the result that investment by telecommunications firm rose sharply after the Act. GDP and the time trend are highly correlated ($\rho = 0.991$), so neither the pre-Act growth rate and GDP are statistically significant in a regression indicating both variables (the post-1996 Act growth rate is, however). Both the pre- and post-1996 Act growth rates in investment are positive and statistically significant relative to GDP, however, with post-Act growth exceeding pre-Act growth by 400%.

Prior to the 1996 Act, the capital stock of telecommunications firm grew on average at an annual rate of 3.0%, whereas after the 1996 Act the annual increase in the stock is 7.9%.¹⁴ Based on a 1980-1995 historical trend, the 1996 Act led to a \$194 billion increase in the capital stock by the end of 2001. The capital stock has not declined post-Act, and remains substantially above trend (about 36% above the forecast level).



III. Conclusion

To borrow a pun, reports of the death of telecommunications investment are greatly exaggerated. A simple examination of the data reveals that investment by telecommunications firms rose sharply after the 1996 Act, and the capital stock of these firms remains substantially above forecasted levels. These considerable changes in investment behavior are confirmed with statistical analysis, though visual inspection is compelling enough.

Unfortunately, the sluggish U.S. economy will continue to slow investment across many, if not most, sectors of the economy, and telecommunications firms will no doubt be affected. Nevertheless, with the introduction of competition, along with its constant companion innovation, a reasonable expectation is that investment by telecommunications firms will continue to be above historical levels.

¹⁴ Piecewise regression confirms that the pre- and post-1996 Act changes in the capital stock are statistically different (t-statistics of the estimated coefficients are 28.4 and 12.0, respectively).

EXHIBIT C

The Financial Implications of the UNE-Platform: A Review of the Evidence

by

T. Randolph Beard, George S. Ford, and Christopher C. Klein

Recent reports on the financial consequences of UNE-P sales for Bell Operating Companies have drawn additional attention to long-standing complaints by the BOCs that such sales are confiscatory, and amount to “subsidized competition.” This paper subjects the conclusions of these claims and the financial studies upon which they are based to careful scrutiny, and finds that they are largely without merit. Errors in both the calculation of unbundled element revenues, and in the wholesale costs of providing unbundled elements, are identified. Using actual payments by a representative CLEC and publicly available ARMIS expense data, we obtain realistic revenue and current cost figures usable for financial analyses. Our analysis suggests that the wholesale business, taken alone, is profitable for the BOCs.

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The Financial Implications of the UNE-Platform: A Review of the Evidence*

T. Randolph Beard, PhD
George S. Ford, PhD
Christopher C. Klein, PhD

Abstract: Recent reports on the financial consequences of UNE-P sales for Bell Operating Companies have drawn additional attention to long-standing complaints by the BOCs that such sales are confiscatory, and amount to “subsidized competition.” This paper subjects the conclusions of these claims and the financial studies upon which they are based to careful scrutiny, and finds that they are largely without merit. Errors in both the calculation of unbundled element revenues, and in the wholesale costs of providing unbundled elements, are identified. Using actual payments by a representative CLEC and publicly available ARMIS expense data, we obtain realistic revenue and current cost figures usable for financial analyses. Our analysis suggests that the wholesale business, taken alone, is profitable for the BOCs.

* An earlier version of this paper appeared as Phoenix Center Policy Paper No. 17 (www.phoenix-center.org). The estimation methodology has changed significantly from the earlier version, and follows George S. Ford, *The Myth of Below Cost UNE Prices*, Unpublished Manuscript (Feb. 2003), www.telepolicy.com. Beard: Professor of Economics, Auburn University. Ford: Chief Economist, Z-Tel Communications. Klein: Professor of Economics, Economics and Finance Department, Middle Tennessee State University, Murfreesboro, Tennessee, and former Chief Economist for the Tennessee Regulatory Authority. We thank Larry Spiwak for helpful comments, and for preparing the manuscript for publication, and we are grateful to Bob Loube for his comments, suggestions, and criticism provided to us during his effort to replicate the analysis. Any remaining errors are the responsibility of the authors.

I. Introduction

The primary purpose of the Telecommunications Act of 1996 ("1996 Act") was to promote competition in the local exchange telecommunications marketplace – the last vestige of the telecommunications monopoly.¹ Congress aimed to alter the competitive landscape of local telecommunications by splitting the integrated local phone market into its wholesale and retail components.² In the post-1996 Act environment, firms seeking to offer retail local telephone services need not construct a local exchange network, but may offer services by acquiring the necessary facilities in a "wholesale market" where such facilities are bought and sold.

When the 1996 Act was signed into law in February 1996, however, there was only one firm capable of supplying the wholesale market (in each local market) – the incumbent local exchange carriers or "ILECs." A similar situation persists today. Consequently, the wholesale prices of these wholesale monopolists were to be regulated and based on "cost."³ "Cost" was defined by the Federal Communications Commission ("FCC") as total element long run incremental cost ("TELRIC"), which was described in the FCC's *First Report and Order* in August of 1996.⁴

¹ See S. 652, H. Rpt. 104-458, 104th Cong., 2d Sess. (1996).

² See *Verizon Communications Inc. v. FCC*, 122 S. Ct. 1646, 1662 (2002) ("Congress aim[ed] to ... reorganize markets." "[W]holesale markets for companies engaged in resale, leasing, or interconnection of facilities cannot be created without addressing rates. * * * The Act...favor[ed]...novel rate setting designed to give aspiring competitors every possible incentive to enter local retail telephone markets"). For a full discussion of the *Verizon* Opinion and the current FCC broadband initiatives, see Lawrence J. Spiwak, *The Telecoms Twilight Zone: Navigating the Legal Morass Among the Supreme Court, the D.C. Circuit and the Federal Communications Commission*, PHOENIX CENTER PAPER SERIES NO. 12 (August 2002) (<http://www.phoenix-center.org/pcpp/PCPP13Final.pdf>); COMMUNICATIONS WEEK INTERNATIONAL, *Opinion: U.S. Competition Policy – The Four Horsemen of the Broadband Apocalypse* (01 April 2002) (available at <http://www.phoenix-center.org/commentaries/CWIForsemen.pdf>).

³ Section 252(d)(1) of the 1996 Telecommunications Act states, "rates for the interconnection of facilities and equipment ... shall be ... based on the cost of providing the interconnection or network element....").

⁴ *In re Implementation of the Local Competition Provisions in the Telecommunications Act of 1996*, First Report & Order, 11 FCC Rcd 15499 (1996) (Section 251 Order).

While the FCC defined the cost standard, it was the State regulatory commissions that were assigned the task of implementing the standard.⁵ Wholesale prices for unbundled network elements ("UNEs") – that is, the network facilities retail providers "buy" from the ILEC – have been and continue to be determined in evidentiary hearings before each state's respective regulatory commission.⁶

The 1996 Act has led to increased competition in many local telecommunications markets, though generally not to the extent many had hoped.⁷ Today, the combination of unbundled elements called "UNE-P" or "UNE-Platform" – a combination of unbundled loops, switching, transport, and signaling -- is the most successful mode of competitive entry created by the 1996 Act, and its growth substantially exceeds the alternative modes of entry.⁸ This success has brought UNE-P under attack by the Bell Operating Companies ("BOCs"), and their assault on the successful entry mode is multifaceted.⁹

⁵ *Id.* at ¶28 ("The 1996 Act requires the States to set prices for interconnection and unbundled elements that are cost-based, nondiscriminatory, and may include a reasonable profit.")

⁶ Letter from Commissioners Joan Smith and Robert Nelson (Chair and Co-Chair of the National Association of Regulatory Utility Commissioners, Telecommunications Committee) to the Honorable Thomas Daschle (September 27, 2002).

⁷ Yochi J. Dreazen, *FCC, Faced with Telecom Crisis, Could Let a Bell Buy Worldcom*, WALL STREET JOURNAL (July 15, 2002) at A-1.

⁸ *UNE-P Fact Report*, Pace Coalition (January 2003).

⁹ See, e.g., TR DAILY (9/6, 9/10, 9/11, 9/13, 9/17, 9/18, 9/24, 9/25, 9/26, 9/27); Glenn Bischoff, *USTA Calls For the End of UNE-P*, TELRIC, TELEPHONYONLINE.COM (Sept. 13 2002). See also SBC Press Release (September 17, 2002) where, according to SBC President Richard Daley, TELRIC pricing is "below cost" and is an "irrational and unsustainable subsidy that is threatening the future of our telecommunications infrastructure." *Washington Telecom Newswire* (September 9, 2002) (According to Verizon CEO Ivan Seidenberg: "State commissions don't get it. They don't have a clue because they are trapped" in an old view of regulatory policy.") Such criticisms are particularly puzzling given that the Bells' publicly reported to the FCC that States imposed TELRIC pricing as a pre-condition of receiving authority under Section 271 of the Telecommunications Act to provide in-region inter-LATA service. See, e.g., *Ex Parte* Presentation, Messrs. I. Seidenberg, W. Barr, and T. Tauke and Ms. D. Toben, representing Verizon, met separately with Chairman Powell and Mr. C. Libertelli, Commissioner Abernathy and Mr. M. Brill, Commissioner Copps and Mr. J. Goldstein, and Commissioner Martin and Mr. D. Gonzales (Ms. Toben did not attend this meeting), WC Docket No. 01-202, Verizon Petition for Emergency Declaratory and Other Relief; CC Docket No. 01-338 Review of the Section 251 Unbundling Obligations of Incumbent Local Exchange Carriers; CC Docket No. 96-98, Implementation of the Local Competition Provisions in the Telecommunications Act of 1996; and CC Docket No. 98147, Deployment of Wireline Services
(Footnote Continued. . . .)

First, the BOCs argue that UNE-P deters Competitive Local Exchange Carrier ("CLEC") investment and deployment of switching equipment. This claim, however, does not survive econometric scrutiny.¹⁰ Second, and more recently, the BOCs have begun to criticize the State regulatory commissions by accusing the commissions of incorrectly applying TELRIC in their determinations of wholesale prices.¹¹ One claim is that the State commissions disregard "true" costs when they set wholesale prices, and instead choose wholesale prices that ensure sizeable margins for CLEC entrants.¹² Again, empirical evidence does not support the BOCs' claim in this regard.¹³

An alternate but related claim is that wholesale prices for UNE-P do not cover the BOCs' actual operational costs for supplying a switched access line.¹⁴ Financial analysts have fueled the BOCs' claims against UNE-P, suggesting that revenues from UNE-P are insufficient to cover operating costs, but the accuracy

Offering Advanced Telecommunications Capability, August 16, 2002, at 16. *See also* CCMs (2002) and UBSWarburg (2002).

¹⁰ *See* T.R. Beard, G. S. Ford, and T.M. Koutsky, *Mandated Access and the Make-or-Buy Decision: The Case of Local Telecommunications Competition*, Unpublished Manuscript (2002): www.telepolicy.com; Z-Tel paper No. 4 (2002): www.telepolicy.com.

¹¹ TR DAILY (Sept 27 2002) (reporting that Qwest wrote a letter to FCC Chairman Michael Powell claiming that "wide gulf separates TELRIC as it was originally conceived from TELRIC as it is now being applied in many States."); TR DAILY Sept. 11, 2002 (SBC says some of the key inputs being used in State cost proceedings are "at odds with market realities and inconsistent with the core assumptions inherent in TELRIC itself."); Bell South *Ex Parte* (Aug 28, 2002) CC Docket No. 01-338 ("Some State PSCs have abandoned any semblance of cost (including TELRIC) in setting wholesale rates").

¹² *See, e.g.*, SBC Press Release (September 17, 2002), *supra* n. 7; *see also* TR DAILY Sept. 11 2002, further quoting Mr. Daley as stating that in some cases, State regulatory commissions "make no attempt even to determine the correct input" for the TELRIC model, Mr. Daley charged. "Instead, they choose inputs that will achieve a predetermined end-result: a TELRIC rate that will give AT&T the 45% margin it demands before it will enter local markets" using the unbundled network element platform (UNE-P); *accord*, Bell South *Ex Parte* Aug. 28, 2002 ("Some State PSCs have abandoned any semblance of cost (including TELRIC) in setting wholesale rates, and instead are increasing resale discounts to levels that AT&T and other CLECs claim they need to operate profitably in residential markets)."

¹³ T. Randolph Beard and George S. Ford, *What Determines Wholesale Prices for Network Elements in Telephony? An Econometric Evaluation*, PHOENIX CENTER PAPER NO. 16 (September 2002) (<http://www.phoenix-center.org/pcpp/PCPP16.pdf>).

¹⁴ *See, e.g.*, SBC Press Release (September 17, 2002), *supra* n. 7; *see also* Verizon *Ex Parte* (Aug. 16, 2002), CC Docket No. 01-338.

of the calculations made by these analysts on both the revenue and cost-side of the issue has been questioned.¹⁵

We consider the claims of the BOCs, and the related claims of the financial analysts' reports, in this paper. Specifically, we provide revenue and cost estimates for the BOCs' switched access lines at both the retail and wholesale level. Our approach is more direct than that of the financial analysts who have typically used completely arbitrary means by which to infer costs. Since public data allows for the more direct calculation of wholesale operating costs, the degree of arbitrariness can be reduced substantially. Further, the cost detail provided in the data allow for better estimates of avoided costs, since certain expenses are avoided (*e.g.*, billing, marketing, and customer service) while others are passed along to the CLEC serving the customer (*e.g.*, access charges).¹⁶

The relationship between UNE-P revenues and wholesale costs requires estimates of revenues. UNE-P revenues realized by the BOCs, however, are not easily computed, at least not correctly. To evaluate the reasonableness of the BOCs' claims regarding UNE-P and "actual" costs, we rely on actual, per-line payments to BOCs by a CLEC using UNE-P to provide service in 46 states. The service offerings of this CLEC are comparable to other CLECs and it provides wholesale services to numerous, large CLECs.¹⁷ Thus, we have no reason to believe this choice materially affects the findings of the analysis.

The balance of this paper is outlined as follows. In Section II, we briefly discuss the relationship between TELRIC and current operating cost. Generally, TELRIC does not address the revenues needed to cover current or embedded operational costs or depreciation. TELRIC derived prices may or may not cover

¹⁵ PHOENIX CENTER PAPER NO. 16, *supra* n. 11; *Ex Parte* Letter to FCC Chairman Michael Powell from Robert Curtis and Thomas Koutsky, Z-Tel Communications, Inc., Docket No. 01-338 (Sept. 23, 2002); Letter to FCC Chairman Michael Powell from Donna Sorgi, Worldcom Inc., in Docket No. 01-338 (September 16, 2002). The financial analysts' reports include *Status & Implications of UNE-Platform in Regional Bell Markets*, Capital Commerce Markets, (November 1, 2001 and August 22, 2002); *How Much Pain From UNE-P?* Global Equity Research, UBS Warburg (Aug. 20, 2002); *Telecom Act Seven Years On – The UNE Shock Wave Belatedly Reverberates Around the RBOCs – And How!* Merrill Lynch (Sept. 23, 2002).

¹⁶ Access charges are paid by long distance carriers to local exchange calls when originating or terminating a long distance call.

¹⁷ Kris Hundley, Venture with MCI gives Z-Tel a boost, *St. Petersburg Times*, Online Business (March 22, 2002); Z-Tel and Sprint Sign Agreement for Wholesale Services, *Business Wire* (Feb. 4, 2003).

such costs. Thus, the BOCs' claims regarding wholesale prices and profit margins based on embedded costs have no meaningful connection to the correct application of TELRIC. Next, in Section III, we present estimates for the BOCs' per-line revenues for UNE-P. We then describe our computation of wholesale costs in Section VI. Computed gross and net profit margins are presented in Section IV. We ignore the implications of long-distance margins on the BOCs' financials. Our approach focuses solely on the BOC as a wholesale provider of local telecommunications plant. The broader policy issues related to competition across telecommunications markets are left for others to debate. In Section V, we briefly consider the validation of our findings. Concluding comments are provided in Section VI.

II. Current Costs, Embedded Costs, and TELRIC

Recent financial analyses by Commerce Capital Markets ("CCM"), Merrill-Lynch ("ML"), and UBS Warburg ("UBS") have focused attention on the general charge by BOCs that UNE-P pricing is "confiscatory" (*i.e.*, a rate set by government that is below costs and therefore constitutes an unlawful takings under the Constitution).¹⁸ While economists are unlikely to be fully convinced by such analyses (relying, as they do, on the validity of accounting cost data and other strong assumptions), any finding of consistently negative margins for element sales is a cause for concern, regardless of these caveats. Thus, it is worthwhile to evaluate some recent findings on this point in order to highlight the extent to which official concern is warranted.

The issue of the remunerative quality of UNE-P sales by the BOCs highlights several important points relevant to any financial analysis of firm activity. First, for reasons that need not be repeated here, caution should be attached to all such analyses that utilize accounting (rather than economic) costs.¹⁹ In general, accounting costs are not equal to economic costs, and profitability in the *economic* sense is the appropriate yardstick for, and basis of, firm decisions. Nevertheless,

¹⁸ For a primer on basic ratemaking principles, see Mark Naftel and Lawrence J. Spiwak, *THE TELECOMS TRADE WAR: THE UNITED STATES, THE EUROPEAN UNION AND THE WTO* (Hart Publishing 2000).

¹⁹ For a general discussion on the use of accounting data, see Stephen Martin, *ADVANCED INDUSTRIAL ECONOMICS* (1993), Ch. 17.

we calculate and present the gross (EBITDA) and net profit margins in what follows.²⁰

Second, aggregation will play an important role in our analysis, as it does in the financial analysts' reports we evaluate here. From a theoretical point of view, however, any claim that element sales are "below costs," somehow defined, must be understood as amounting to a claim that "some set of elements are, in fact, sold on below cost terms." The claim that an element could be sold "below cost" is financially irrelevant if no one actually buys the element, or buys the element in combination with other elements priced above costs. Further, elements sold for prices above costs, but below cost-plus-seller-rents, will "damage" the seller financially, in the same manner that a monopolist forced to yield its position is damaged. Damage of this sort is presumably not a public concern *per se*. These distinctions are largely unaddressed in the financial reports.

Also, as a matter of economic theory, TELRIC pricing is not designed to reimburse the element seller for "actual" or "embedded" costs.²¹ Such embedded costs reflect the cumulative sum of the economic costs of resources acquired by the BOC over time, not the economic cost or "value" of the elements that were created with those resources. For example, a \$10 steak burned to a crisp is not worth \$10, since one could obtain the result – a lump of carbon – for less than \$10. Nor is a 100-megahertz computer worth \$1,000 today, despite the fact it sold for that amount a few years ago. In general, the economic cost of a product is the cost of the resources required by an efficient producer to *duplicate* all the valued services provided by that product.

The determination of wholesale prices for unbundled elements (particularly UNE-P) by State commissions has itself been the subject of recent research (Beard and Ford 2002).²² Although Beard and Ford (2002) show that prices are not

²⁰ EBITDA is defined as earnings before interest, taxes, and depreciation/amortization.

²¹ See *Section 251 Order supra* n. 3 ("Forward-looking cost methodologies, like TELRIC, are intended to consider the costs that a carrier would incur in the future" (§ 682); "We read section 252(d)(1)(A)(i) to prohibit States from conducting traditional rate-of-return or other rate-based proceedings to determine rates for interconnection and access to unbundled network elements" (§ 703); ("We reiterate that the prices for the interconnection and network elements critical to the development of a competitive local exchange should be based on the pro-competition, forward-looking, economic costs of those elements, which may be higher or lower than historical embedded costs" (§ 704)).

²² See *supra* n. 13.

determined by either the BOCs' embedded costs or retail prices, the authors provide evidence that many State commissions set wholesale prices at a point about halfway between forward-looking costs (economic cost) and forward-looking cost plus the average retail margin. This latter value approximates the efficient component pricing rule ("ECPR") price, ignoring the lack of competition that gives rise to the relevant economic rents (*i.e.*, profits, loosely defined).²³ Thus, while it is correct that TELRIC does not provide a mechanism for embedded cost recovery, it has been modified in practice to allow price increases that compensate the seller for a portion of retail margins.

Thus, the impact of element sales on BOC financial performance is a complex matter. BOC resistance to such sales is proof that the sales reduce BOC profits. Competition inevitably erodes excess profits and this is desirable for everyone except for the BOC (and, potentially, its shareholders).²⁴ Financial analysts, such as those who produced the Merrill-Lynch analysis, are paid to advise investors, not to promote social welfare or competition. However, the BOC campaign against the current UNE-P environment seems to suggest that element sales actually threaten the financial solvency of the BOCs. Such solvency does depend on embedded costs, of course, as debt is a current obligation for the past use of resources.

In this paper, we calculate BOC margins for UNE-P sales that include embedded costs as contained in cost data given to the FCC by the BOCs in order to credibly evaluate the implication of the recent analysts' studies that UNE-P is unprofitable for the BOCs. This analysis allows a credible evaluation of the conclusion implied by recent Wall Street financial analysts' reports that UNE-P is unprofitable for the BOCs, potentially leading to under-investment and financial ruin for these telecommunications giants. We endeavor to measure revenues and costs as accurately as possible given the data sources available to us. In this way, we hope to shed light on the current debate over this matter, and potentially raise the sophistication of future studies on this topic by the financial community.

²³ According to the ECPR, "the access fee paid by the rival to the monopolist should be equal to the monopolist's opportunity costs of providing access, including any forgone revenues from a concomitant reduction in the monopolist's sales of the complementary component." Nicholas Economides and Lawrence J. White, *Access and Interconnection Pricing: How Efficient is the Efficient Component Pricing Rule?* 40 ANTITRUST BULLETIN (1995), p. 557-79.

²⁴ See, *e.g.*, C.K. Prahalad and Gary Hamel, *The Core Competence of the Corporation*, HARVARD BUSINESS REVIEW (May 1, 1990).

III. BOC Revenues from Wholesale Local Exchange Services

UNE-P is a combination of numerous unbundled elements including primarily an unbundled loop, unbundled switching, and unbundled transport.²⁵ Related elements are signaling services necessary to route calls, daily usage files (describing customer calling) needed for billing purposes, and non-recurring charges levied when these elements are ordered, provisioned, or repaired.²⁶ UNE-P CLECs also pay the BOC reciprocal compensation (in some states), and many continue to use the Operator Services and Directory Assistance ("OS/DA") of the BOC. OS/DA is purchased by the CLEC as a retail service, not as an unbundled element.²⁷ In some states, additional sources of revenue are present, such as the Operational Support Systems ("OSS") charge of \$0.55 per line/month in New York.²⁸

A. Sources for BOC Wholesale Prices for UNE-P

In an effort to measure BOC revenues from UNE-P, we evaluate four sources of revenue data: three reports from various financial analysts and confidential data provided to the authors by Z-Tel Communications. Z-Tel Communications is a CLEC that serves customers, via UNE-P, in 46 states.²⁹ Given Z-Tel's actual experience with UNE-P, and its ability to estimate costs directly from the bills it receives from the BOCs, we consider Z-Tel's numbers to be the best indicator of

²⁵ The unbundled loop is a pair of copper wires that runs from the consumer's household to the BOCs central office. Switching directs a call to the intended recipient, and if the recipient of the call is not in the same central office as the customer originating the call the call must be transported over facilities to another central office.

²⁶ The signaling network establishing a "path" between the originating and terminating phone, and ensures that the receiving phone is operational. A daily usage file is a record of call and call lengths for each individual customer. Many installation and repair services are provided to CLECs by the BOCs, and the CLECs compensate the BOCs for such services by paying "non-recurring charges."

²⁷ *In re Implementation of the Local Competition Provisions of the Telecommunications Act of 1996, Third Report and Order and Fourth Further Notice of Proposed Rulemaking*, FCC No. 99-238, 15 FCC Rcd 3696 (rel. Nov. 5, 1999) ("UNE Remand Order") at ¶ 441-442.

²⁸ This charge is intended to cover the expenses incurred by Verizon to allow its computer systems to handle wholesale operations. See New York Tariff #10 Sec 5.9.3.

²⁹ Letter to FCC Chairman Michael Powell from Robert Curtis and Thomas Koutsky, *supra* nt. 15.

BOC revenues from UNE-P.³⁰ That said, Z-Tel's experience might not be identical to that of other CLECs using UNE-P (*e.g.*, usage or density zone distributions may vary among CLECs). Given no indication that Z-Tel's experience is atypical for a UNE-P CLEC, we consider Z-Tel's experience to be representative.³¹

B. *Difficulties in Estimating Wholesale Prices for UNE-P*

Computing the BOCs' revenues from UNE-P is a difficult task. Financial analysts typically compute UNE-P revenues as if rates simply can be multiplied by usage and added to flat charges, but it is not that easy.³² For example, switching typically consists of a flat-rated port charge, features charges, and per-minute charges.³³ In some states (IL, IN, WI), the usage costs are included in the port charge, and in others the feature charges are included in the port charge. In other states, usage and features charges are separate from the port charge. Additionally, CLECs vary in their demands for features, and their customers are likely to vary in their usage patterns. With respect to usage, the application of specific usage charges varies by BOC, and frequently varies within a single BOC region. For example, in some states, an intra-switch call incurs two-minutes of switching per minute of conversation (*e.g.* West Virginia), while in others an intra-switch call incurs only a single minute charge per minute of use. In some states reciprocal compensation is paid by the CLEC (the former Ameritech states), whereas other states have adopted a bill-and-keep arrangement. In some Verizon states, terminating switching and reciprocal compensation are treated as offsets in a type of pseudo bill-and-keep arrangement (*e.g.*, New York). In states

³⁰ Z-Tel has adjusted its costs to reflect recent changes in wholesale prices in a number of States. In many cases, Z-Tel does not yet pay these rates to the BOCs due to lags in the incorporation of new rates into their interconnection agreements.

³¹ Data provided by SBC to the FCC indicates that Z-Tel's experience in the SBC region is typical, and that the distribution across density zones of UNE-P entry closely parallels the distribution of access lines across such zones. *See SBC Ex Parte*, CC Docket 01-338 (October 30, 2002).

³² Charges for unbundled switching typically consist of a flat monthly fee (a port charge) and a fee per minute of usage (usage based charges). There may be many applicable usage charges depending on the time-of-day the call is made and how far and what equipment the call travels through on its way to its destination. Thus, information is needed on the total number of minutes, when calls were made, and where calls were originated and terminated.

³³ Charges for switch features (caller ID, call waiting, etc.) are levied either on a per-feature or all features basis.

where switching charges are usage sensitive, the usage of the customers can matter substantially (depending on the per minute switching rate). Computing transport cost is particularly difficult, and the application of charges varies substantially across states. Transport costs, however, are generally a small portion of total UNE-P revenues (typically less than 5% for Z-Tel).³⁴

C. Revenues from Non-Recurring Activities

Non-recurring charges (“NRCs”) are another source of revenues for the BOC from UNE-P, but these revenues are frequently ignored in the analysts’ reports.³⁵ In principle, non-recurring charges compensate the ILEC for expenses associated with taking orders for and provisioning a line to a CLEC. For UNE-P, there are typically three categories of non-recurring costs. For ordering and provisioning a customer, there is either a migration NRC or a “new install” NRC. The migration NRC is paid when the customer already has service with the ILEC, whereas the “new install” NRC is paid when the customer does not have existing service.³⁶ Because ARMIS data includes all labor and provisioning expenses regardless of whether such costs relate to services provided to the ILEC itself or its CLEC customer-competitors, the costs related to ordering and provisioning services to CLECs are included in the ARMIS expense data. Because the expenses related to such activities are included in the analysis on the expense side, it is therefore necessary to include revenues from NRCs in the analysis on the revenue side.

Publicly available information from CLECs suggests that about one-third of customers are new installs, and we assume that this is typical for the purposes of our calculations.³⁷ FCC data indicates that there were 5.7 million UNE-P lines at year-end 2001.³⁸ These access lines are allocated across states based on the

³⁴ Computed by dividing transport costs by total costs using data provided the authors by Z-Tel Communications.

³⁵ CCM includes some revenues for NRCs in its analysis, but the charges appear to be grossly understated and are amortized over 3 years (which is a relatively long customer life and an inappropriate method by which to assess BOC revenues from NRCs). For comparability purposes, the NRC revenues are excluded from the summary figures in Table 2.

³⁶ There are also NRCs for “change orders,” such as when a customer wants a new phone number or some other change occurs to their account. We do not include revenues from such activities, thus making our NRC revenues understated.

³⁷ Testimony of George S. Ford on Behalf of Z-Tel Communications, IN Cause 40611-S1 (November 11, 2001).

³⁸ UNE Fact Report 2002, published by the United States Telephone Association, Table 3.

relative shares from the Form 477 data.³⁹ FCC data on UNE-P lines (Form 477) indicate that UNE-P lines increase, on average, by about 3.6% per month (from June to December 2001).⁴⁰ Public information suggests a monthly churn rate for UNE-P customers of about 6.67%, which can be added to the customer base growth rate of 3.6% for a total migration/new-install rate of about 10.25%.⁴¹

Table 1. Average Non-Recurring Charge Revenue for UNE-P

(Excluding Change Order NRCs)

BOC	Share	UNE-P Lines ^a	Avg. NRC ^b	Per- Line
Verizon	39%	2.19M	13.12	1.34
BellSouth	11%	0.62M	12.27	1.26
SBC	42%	2.39M	25.67	2.63
Qwest	8%	0.46M	20.37	2.09
BOC-Wide	100%	5.66M	18.73	1.92

^a FCC Form 477 Data (December 2001).

^b Z-Tel Communications.

Access line weighted NRCs by BOC (one-third new install, two-thirds migration) are presented in Table 1. To compute the per-line NRC, the average BOC NRC is multiplied by the 10.25% growth/churn rate. As shown in Table 1, the average monthly revenue per UNE-P line from NRCs is \$1.92 and ranges from \$1.26 in the BellSouth Region to \$2.63 in the SBC region.

D. Wholesale Prices for UNE-P

Keeping in mind the difficulties of accurately calculating UNE-P revenues, the estimates of CCM, ML, UBS and Z-Tel are summarized in Table 2. Estimates are provided at the BOC level only, to protect (to some degree) the confidentiality of the Z-Tel data. Table 2 illustrates the sizeable understatement of UNE-P revenues by the financial analysts. Z-Tel pays the BOCs about 43% more than the UBS estimates, 30% more than the ML estimates, and 11% more

³⁹ Form 477 data is that data collected by the FCC from CLECs and BOCs regarding the number of access lines served and/or sold. The Form 477 data does not include data for all States due to confidentiality concerns, so we rely on the total number of UNE-P lines from the UNE Fact Report 2002, using the State specific information from the 477 data to allocate across BOCs. For details, see http://ftp.fcc.gov/broadband/broadband_data_faq.html.

⁴⁰ Computed as the percentage increase in UNE-P access lines across states between June and December 2001 (divided by six to produce a monthly growth rate).

⁴¹ The estimated churn rate of about 6.7% is based on MCI Ex Parte, CC Docket No. 01-338 (Nov. 15, 2002).

than the CCM estimates (without NRCs). These differences may emerge from differences in the distribution of loop rates across density zones, different usage patterns, different assumptions regarding the number of features purchased, the exclusion of costs related to some elements, and many other reasons.⁴² CLECs have indicated that usage is one primary driver of the differences between actual costs and the costs estimated by the analysts.⁴³

Also observe (in Table 2) that, on average, the inclusion of the NRC revenue increases BOC revenues from UNE-P by about 9%. Overall, actual CLEC experience suggests that the revenues received by BOCs are considerably higher than the financial analysts' estimates indicate. This general understatement of revenues by financial analysts is important, since when evaluating EBITDA margins (or any margin for that matter) small changes in revenues or costs are reflected directly in the margin.

⁴² The loop rate is the charge for the copper wire that runs from the consumer's household or business to the BOCs central office. It is a flat, monthly recurring price and has no usage sensitive price component. Differences in loop rates explain about \$0.36 of the difference between Z-Tel and CCM, on average. UBS assumes 80% of access lines are in the Urban (Zone 1) density zone. Recent SBC data suggests that only 25% of UNE-P lines are in the Urban zone. *See SBC Ex Parte*, CC Docket No. 01-338 (October 30, 2002).

⁴³ *See, e.g., Z-Tel Letter and Sorgi Letter, supra* n. 15.

Table 2. BOC Specific UNE-P Revenues Per Line

	(Dollars per line/month)			
	UBS	ML	CCM	Z-TEL
<i>Without NRC Revenue</i>				
Verizon	15.08	17.29	20.20	23.08
BellSouth	18.79	19.97	24.38	31.54
SBC	13.98	15.02	17.31	17.94
Qwest	18.53	21.05	23.98	22.54
BOC-Wide	15.75	17.37	20.30	22.51
<i>With NRC Revenue</i>				
Verizon	16.43	18.63	21.54	24.43
BellSouth	20.05	21.23	25.64	32.80
SBC	16.61	17.65	19.94	20.57
Qwest	20.61	23.14	26.07	24.63
BOC-Wide	17.67	19.29	22.22	24.43
Weighted averages based on switched access lines from ARMIS data (2001), and therefore may be slightly different from those reported in the respective analysts reports.				

There are two methods by which the quality of the analysts' estimates can be evaluated, and these two methods are best applied jointly. First, we can evaluate the average revenue (at the BOC-level) to determine how close the estimates are to actual experience. Table 2 provides such a comparison, and indicates the financial analysts' estimates of revenue are far below the actual experience of a UNE-P CLEC. Second, we consider the fact that the BOC average revenues are averages of state-level UNE-P revenues per line. Because a good estimate of a BOC's *average* revenue from a UNE-P line could arise from state-level revenue estimates that are entirely unrelated to what CLECs actually pay, we also examine the correlation between the state-level revenue estimates and actual experience.⁴⁴ A high positive correlation would suggest that the Wall Street analysts' estimates may accurately reflect a BOC's average UNE-P revenue per line. The correlation matrix is provided in Table 3. Although the correlation coefficients between the analysts' estimates and Z-Tel's actual experience are positive, the correlations are not very large (*i.e.*, not close to 1.00 which indicates perfect correlation). Thus, the analysts' estimates are "poor" reflections of actual revenues from UNE-P under both evaluation methods.

Considering both the level and correlation of the analysts' estimates to actual experience, the "best" analyst estimate of UNE-P revenues is provided by CCM,

⁴⁴ For example, the number pairs (10, 20) and (25, 5) both average to \$15, but the average is based on very different underlying values.

which underestimates Z-Tel's actual experience by about 11% and has a correlation coefficient of 0.68 (excluding NRCs). Most of this difference is observed in the BellSouth region. Even though 10% may seem to be a relatively small difference, the additional \$2.21 in revenue it represents is important when computing EBITDA margins.⁴⁵ Further, on a state-specific basis, there may be very large differences that are masked in the average (but revealed to some degree by the correlation coefficient). For example, in one state, CCM underestimates Z-Tel's wholesale prices by 56%.⁴⁶ In 7 out of 46 states (15%), CCM understates BOC wholesale prices by 25% or more.⁴⁷ In some cases, CCM overstates the BOCs' wholesale prices (but none by as much as 25%). Overall, CCM understates BOC revenues for 65% of states with an average understatement of 16%, whereas CCM overstates revenues for 35% of states with an average overstatement of 8%.

Table 3. UNE-P Revenues Correlation Matrix

	CCM	ML	UBS	ZTEL
CCM	1.00	0.87	0.66	0.68
ML	0.87	1.00	0.77	0.64
UBS	0.66	0.77	1.00	0.57
ZTEL	0.68	0.64	0.57	1.00

Regardless of the source of the revenue estimates, SBC clearly has the lowest per-line revenue from UNE-P of the four BOCs (see Table 2), driven primarily by the low UNE-P rates in the former Ameritech region. BellSouth has the highest UNE-P revenues per line according to CCM and Z-Tel, and Z-Tel data indicate that BellSouth's rates embody high charges for switch features and the daily usage file, charges that do not appear to be properly accounted for by UBS, ML, and CCM. For example, in Alabama, the switch features (as a bundle) have a wholesale price of \$5.55 and the switch port is \$2.07 (for a port/features total of \$7.62, not including usage).⁴⁸ Yet, the CCM data lists switching costs in Alabama

⁴⁵ The EBITDA margin equals revenue minus all expenses except for interest, taxes, and depreciation/amortization. Thus, increases in revenue, holding expenses constant, increase EBITDA.

⁴⁶ Computed as the percentage difference between the average cost per line as reported by Z-Tel Communications and CCM.

⁴⁷ Based on a state-by-state comparison of the average UNE-P costs reported by Z-Tel Communications and CCM.

⁴⁸ See Agreement between BellSouth Telecommunications Inc. and Z-Tel Telecommunications Inc. (dated June 2000), pp. 168 and 171.

(including usage and transport) of only \$5.46, UBS lists \$4.67, and ML lists \$3.77. Clearly, the financial analysts have not estimated UNE-P revenues correctly (at least for some states). Understating revenues, even by a small amount, is a non-trivial matter when computing EBITDA margins on a BOC or state-level basis.

IV. Retail and Wholesale Costs per Access Line

Through the Automated Reporting Management Information System ("ARMIS"), the BOCs report detailed cost information to the FCC. This data is highly disaggregated, unlike the financial forms submitted to the Securities and Exchange Commission. Using this data, we compute the average retail and wholesale cost per line for each BOC. The ARMIS does not, however, directly allocate costs between retail and wholesale functions. To compute wholesale costs, we exclude, as best we can, costs associated with the provision of retail services by the BOC. Once the wholesale costs are computed, we can then compare these wholesale costs to revenues received from CLECs using UNE-P.

A. Wholesale Operating Expenses

BOC expenses related primarily to the provision of switched access line services are summarized in ARMIS Form 43-01 (Year 2001).⁴⁹ The major categories of operating costs from Form 43-01 are summarized in Table 4. We include only costs that are allocated in ARMIS 43-01 to "Common Line" (i.e., loops), "Traffic Sensitive Switching," and "Traffic Sensitive Transport."⁵⁰ These expenses are summarized for the Interstate portion alone in ARMIS, so we convert these to total expenses by dividing the reported expenses by the appropriate separations factor: Common Line expenses are divided by 0.25, switching expenses are divided by the ratio of interstate to total ("Subject to Separations") dial equipment minutes ("DEMS"), and transport expenses are divided by twice the aforementioned DEMS ratio.⁵¹ The operating costs listed in Table 4 are further disaggregated in other ARMIS forms, including ARMIS Forms 43-03 and 43-04. Our analysis is limited to the summary categories only,

⁴⁹ Other forms provide similar information, often at a higher or lower level of aggregation.

⁵⁰ Basic telephone service, such as UNE-P, includes loops, switching, and transport network elements.

⁵¹ These calculations follow exactly those made a BOC expert witness. See Direct Testimony of Dr. Debra J. Aron, Texas Docket No. 25834 (Nov. 4, 2002). The DEMS factors are computed from ARMIS Form 43-04, Row 1216.

with the exception of “Plant Non-Specific” expenses, which contains some cost elements that should be allocated between wholesale and retail segments.

Table 4. Expense Categories ARMIS Form 43-01

Row_#	Row_Title
1120	Plant Specific
1130	Plant Non-Specific
1140	Customer Operations Marketing
1150	Customer Operations Services
1160	Corporate Operations
1170	Access
1180	Depreciation/ Amortization
1185	FCC Expense Adjustment
1190	Total Operating Expenses

While Form 43-01 provides expense data at the state level, it appears (to us) that the allocation of expenses across states does not allow for reasonable state-specific estimates of expenses to be computed. For example, negative expenses are listed in some cases.⁵² Also, expenses of nearly all types appear to be over-allocated to New York, Georgia, Texas, and Colorado – states where the BOCs’ corporate headquarters are located.⁵³ ARMIS includes a substantial degree of allocation across states, and we wish to avoid to the greatest extent possible any arbitrariness that may accompany such allocations. Thus, we compute expenses and profit margins at the BOC level.

All “Plant Specific” expenses are included in our measure of wholesale costs. Since some of these costs may be related to data services, this assumption, if anything, overstates actual wholesale expenses per line. From “Plant Non-Specific” expenses, we exclude costs related to Terminal Equipment, and half (50%) of those costs related to artwork, furniture, general computers, and similar items are assigned to the retail segment.⁵⁴ “Corporate Operations” expenses are assigned using an expense allocation factor, where the factor is equal to the adjusted plant expenses divided by total expenses (excluding “Corporate

⁵² For example, Corporate Operations Expenses (Row 1160) in Missouri are negative.

⁵³ Headquarter states are New York (Verizon), Georgia (BellSouth), Texas (SBC) and Colorado (Qwest).

⁵⁴ These expenses are detailed in ARMIS Form 43-03, Rows 6121, 6122, 6123, and 6124. Terminal equipment is not related to the provision of UNE-P services.

Operations” and “Depreciation”).⁵⁵ “Access” expenses are a retail expense.⁵⁶ Depreciation is a capital expense and is discussed in the next section.

While the (hypothetical) wholesale segment of the BOC does not have retail customers, it will have wholesale customers. For each BOC, we assume that the wholesale customer service and billing operations is equal in size to the BOC’s current expenses related to the billing and collection of access charges from interexchange carriers (a wholesale function). ARMIS Form 43-01 provides this expense data.⁵⁷

B. Wholesale Capital Costs

Positive EBITDA margins do not guarantee accounting profitability, as costs associated with capital investment (*i.e.*, depreciation and a return to capital) are left out of the calculations.⁵⁸ Profitability can be assessed, however, by including levelized capital expenses per access line in the analysis.

ARMIS Form 43-01 provides average net plant data (year 2001) for the “Common Line” and “Traffic Sensitive” cost categories, which are converted to a per-line net plant by application of the allocation factors to produce total net investment and then dividing by switched access lines.⁵⁹ Net plant is converted into a monthly capital payment by multiplying net plant by the annual capital charge factor and dividing by twelve. Application of the annual capital charge

⁵⁵ The average allocation factor is 72%, so much of Corporate Operations is assigned to the wholesale segment.

⁵⁶ Access expenses are reported as zero in ARMIS Form 43-01 for “Common Line” and “Traffic Sensitive” cost categories

⁵⁷ We include total expenses in the “Billing and Collection” category from ARMIS Form 43-01.

⁵⁸ The return to capital is never included as an expense category in financial reporting, and depreciation and amortization are left out of EBITDA because neither is a cash expense.

⁵⁹ Following Aron, *supra*, switched access lines are increased by 5% to account for unbundled lines that are excluded from ARMIS data. SBC reported that its net plant for analog access is \$499 per line in the former Ameritech region. Our computations compute a net plant for this region of \$550. Thus, we adjust the net plant calculations *for all BOCs* downward to 91% of the computed value from ARMIS to produce an estimate for analog dialtone lines.

factor to investment produces a monthly payment that includes the depreciation and return on the investment, including the tax effects.⁶⁰

C. Summary of Cost Estimates

Table 5 summarizes the BOC-specific and BOC-wide average retail and wholesale operating and total expenses.⁶¹ Retail expenses per line are estimated to be \$20.90 per line, which is comparable to ML's estimate of \$19.95 and UBS's estimate of \$19.10.⁶² Wholesale operating expenses per line range between \$9.49 to \$10.91 across BOCs, and average \$10.15. In every case, wholesale operating costs are considerably less than the estimates of either ML (\$17.46) or UBS (\$17.02).⁶³ Table 5 suggests that wholesale costs equal about 50% of retail costs,

⁶⁰ The capital charge factor is $[(1 - A(N, r)(t/N))]/[(1 - t)A(N, r)]$, where t is the tax rate, N is the depreciation life, $A(N, r)$ is the present value of a \$1 annuity for N years computed at the after-tax rate of return equal to r percent. Depreciation life is computed as the inverse of the percentage of net plant depreciated each year (i.e., the ratio of the change in accumulated depreciation and net plant). According to ARMIS Form 43-02, accumulated depreciation is about 10% of net plant per year on average, implying a 10-year depreciation life. The depreciation life varies by BOC (Verizon 9 years; BellSouth 10 years; SBC 11 years; Qwest 12 years). The tax rate is computed from the BOCs' Form 10-K (38%). The cost of capital is based on the following assumptions: a) the cost of short-term debt is 1.31%, which is the yield on 3-Month Non-Financial Commercial Paper in December 2002; b) the average of A and AA rated corporate bonds in December 2002; and an average of the cost of equity of 7.52% computed using the Discounted Cash Flow ("DCF") method (which, in its most basic form, sets the cost of equity equal to the dividend yield plus the expected growth rate in earnings or dividends) using the average of the BOC dividend yields and consensus growth estimates as of December 2002 (www.marketguide.com); and d) a capital structure of 40% debt and 60% equity, with short-term debt making up 20% of debt. As of December 2002, the inputs for the DCF method were (Dividend Yield, Long-term Growth): Verizon (3.89%, 4.08%), BellSouth (2.95%, 4.06%), and SBC (3.74%, 3.85%). Given problems with Qwest's financial statements, we exclude Qwest from the computation. The capital charge factor is computed for each BOC, and is based on an average cost of capital of 6.39%.

⁶¹ Retail costs are computed using ARMIS Form 43-03. Based on the allocations in ARMIS Form 43-01, we assume 75% of expenses in this form are allocated to switched access lines (25% to special access lines). Depreciation is excluded, as it is a capital cost.

⁶² The similarities are not surprising, given that ML uses BOC aggregate data from the FCC's *Statistics of Communications Common Carriers*, which is based on the ARMIS data. For State-level estimates of costs, ML simply adjusts the BOC-wide average operational costs in direct proportion to differences in revenues across States (i.e., the retail EBITDA margin is equal in every State). UBS computes average retail costs by assuming a constant EBITDA margin (across States within a BOC region) on retail revenues, ignoring actual cost data.

⁶³ CCM also provides cost estimates, but these estimates exceed retail revenues (with costs averaging about \$45 per line). Consequently, we do not believe these estimates are credible or worthy of a detailed evaluation. CCM also includes ARMIS depreciation expenses, which are
(Footnote Continued. . .)

not the 12.5% assumed by ML or the 11% assumed by UBS.⁶⁴ Moreover, UBS's assumed avoided cost of 11% is barely sufficient to account for unquestionably avoidable expenses such as sales and marketing and customer service. Clearly, the financial analysts have substantially overstated wholesale costs.

Capital costs average \$7.32 per line/month, ranging from \$6.42 to \$9.35. Total wholesale expenses per line – including capital costs – are \$17.55 on average. Total wholesale expenses are about 38% less than total retail expenses per line/month, on average. BellSouth has the highest and SBC has the lowest total wholesale expense. This relation holds for UNE-P revenues as well, though BellSouth's revenue advantage substantially exceeds the cost differential.

Table 5. BOC Retail and Wholesale Costs

	Retail Costs	Wholesale Operating Expense	Net Investment	Capital Expense	Total Retail Expense	Total Wholesale Expense
Verizon	20.69	10.80	517.82	7.15	27.84	17.95
BellSouth	21.41	10.91	726.28	9.35	30.76	20.27
SBC	21.44	9.49	529.82	6.42	27.86	15.91
Qwest	19.03	9.55	671.79	7.72	26.75	17.27
BOC-Wide	20.90	10.15	578.45	7.32	28.22	17.47

Considering the systematic understatement of UNE-P revenues and the overstatement of wholesale costs, it is no surprise that the analysts find the UNE-P wholesale business unprofitable for the BOCs. We have made clear here, however, that the analysts' findings are (at least partially) the result of poorly estimated revenues and expenses, and consequently provide little information of value either in an investment or policy context.

notoriously incorrect and substantially different from depreciation reported in financial statements. Capital Commerce Markets, *Status & Implications of UNE-Platform in Regional Bell Markets* (November 12, 2001).

⁶⁴ Note that the avoided cost discounts computed using the ARMIS data are not directly comparable to the Total Service Resale discounts; those discounts are applied to revenues, not costs. Additionally, the ILECs continue to incur costs for resellers that are avoided for UNE-P (e.g., Access Expenses).

Table 6. Marginal Effects of Assumptions on Wholesale Costs
(Dollar change for a one percentage-point change in assumption)

	Corporate Operations	Cost of Capital	Avoided Non-Plant Specific
Verizon	0.036	0.38	.020
BellSouth	0.026	0.54	.017
SBC	0.015	0.39	.029
Qwest	0.027	0.50	.022
BOC-Wide	0.025	0.43	.023

Many alternative assumption sets could be used to compute estimates of wholesale costs. In our computations, we attempted to limit the number of assumptions as much as possible. To assess the effect of alternative assumptions, the “marginal effects” of each input are summarized in Table 6. For example, the last cell in column two of Table 6 indicates that for every one percentage-point change in “Corporate Operations” expenses allocated to wholesale lines, the monthly per-line wholesale operating costs increases by \$0.025 at the BOC-wide level.⁶⁵ The last cell of column 5 indicates that a one percentage-point increase in the allocation of furniture, artwork, general computers and so forth to wholesale service increases wholesale costs by about \$0.023 (at the BOC-wide level).⁶⁶ The other cells in the table are interpreted in the same manner.

V. Revenues, Expenses, and the EBITDA Margin

To evaluate the *accounting* profitability (not *economic* profitability) of the wholesale UNE-P relative to its retail equivalent, the gross (EBITDA) and net profit margins for UNE-P wholesale services sold by the BOCs are computed.⁶⁷ These margins equal the difference between UNE-P revenues from Table 2 and the wholesale costs from Table 5. A minimum requirement for accounting profitability, on average, is that the revenues from a service cover the operating expenses incurred in providing it, excluding any costs associated with capital investment. A positive gross margin indicates that this minimal standard of accounting profitability is met. The net margin is an indicator of actual profitability. The margins, presented for each BOC, are summarized in Table 7.

⁶⁵ The average allocation is 72% of Corporation Operations to wholesale services.

⁶⁶ The average allocation is 50% of such expenses to wholesale services.

⁶⁷ Generally, accounting costs do not equal economic costs, particularly for capital expense components of financial data. See J. Edward, J. A. Kay, and C. Mayer, *THE ECONOMIC ANALYSIS OF ACCOUNTING PROFITABILITY* (1987).

Table 7. EBITDA Margins for BOC Wholesale Services (UNE-P)

	UNE-P Revenues	Wholesale Costs	Gross (EBITDA) Margin	Total Wholesale Expense	Net Margin	Implied Return (Pre Tax)
Verizon	24.43	10.80	13.63	17.95	6.48	21%
BellSouth	32.80	10.91	21.89	20.27	12.53	26%
SBC	20.57	9.49	11.08	15.91	4.66	17%
Qwest	24.63	9.55	15.08	17.27	7.36	19%
BOC-Wide	24.43	10.15	14.28	17.47	6.96	20%

On average, the average gross margin for the BOCs is \$14.28, or 58% of wholesale revenues.⁶⁸ The margins vary substantially, with the largest margins found in the BellSouth region (\$21.89) and the smallest in the SBC region (\$11.08). Considering its relative low gross margins on wholesale services, SBC's leadership role in attacking UNE-P and TELRIC is unsurprising.

Including capital expenses in the computation of wholesale margins, which results in an estimate of excess return, does not alter the conclusions -- wholesale margins remain positive. On average, the wholesale net margin is \$6.96, or 28% of revenues. Again, SBC has the lowest margin (\$4.66) and Bellsouth the highest (\$12.53). Implied returns to capital are summarized in the final column of Table 7. These implied returns are computed by increases in the assumed cost of capital until net income is zero. On average, the return to capital for wholesale access lines is 20%. Thus, from the perspective of a wholesale provider of telecommunications plant, UNE-P is *profitable*.

VI. Validation

Our analysis of wholesale costs indicates that, on average, the wholesale cost for a switched access line (*i.e.*, the type of line relevant to UNE-P) is \$10 and depreciation/amortization expenses are about \$7 on a per-line basis. These estimates suggest that current/embedded total wholesale expenses per line are about \$17.

Ideally, there would be some way to validate our estimates with real-world experience. Recent statements by SBC's Chief Financial Officer, Randall Stephenson, provide such validation. Specifically, at the Bank of America

⁶⁸ These margins are generally consistent with those reported in PHOENIX CENTER PAPER NO. 16, *supra* n. 11, which reports an average EBITDA margin of 40%. The differences in the margins are attributed mostly to the use of the CCM revenue data in the earlier paper and to differences in the computation of wholesale costs per line.

Securities 32nd Annual Investment Conference (September 2002), Mr. Stephenson stated:

... in the State of Texas its about a \$20 [to] \$21 UNE-P. In the State of Texas you have a ... rational model; ... at \$20 to \$21 you have good vibrant competition, and it's not at such a level where we cannot earn money or are disincented to invest.⁶⁹

Our estimates suggest that with \$20 to \$21 in UNE-P revenues per line, the BOC is fully compensated for its wholesale operating costs and depreciation/amortization expenses. So, our estimates are consistent with the statement that "at \$20 to \$21" the BOC can "earn money" and is not "disincented to invest." In fact, SBC earns about a 19% return for UNE-P revenue of about \$20.50 (see Table 7). On average, a BOC would earn a return of 15% at UNE-P revenues of \$20.50 per line/month.

Mr. Stephenson also indicated that a UNE-P price of \$14 is "below cost."⁷⁰ Thus, it is reasonable to conclude that SBC views its wholesale costs per UNE-P line as somewhere between \$14 and \$20. Our estimated average wholesale cost of about \$15.97 for SBC and \$17.42 for all BOCs is again consistent with the claims of one BOC's Chief Financial Officer.

We re-iterate, however, that according to FCC policy wholesale prices should not be set such that the BOCs "earn money" at the current level of expenses. Wholesale prices are based on TELRIC, and TELRIC may be above or below current expenses.⁷¹ The positive gross and net margins summarized in this paper suggest that TELRIC, as interpreted and implemented by State regulatory commissions, is typically above embedded costs.

⁶⁹ Speech by SBC Chief Financial Officer Randall Stephenson at the Bank of America Securities 32nd Annual Investment Conference, September 2002 transcription available at www.telepolicy.com).

⁷⁰ *Id.* ("well below cost on anybody's cost modeling assumptions" and "you cannot get to a \$14 UNE price").

⁷¹ TELRIC principles, in practice, provide very little constraint on the determination of wholesale prices. Generally, the concept of "forward-looking costs" is far more important to the determination of wholesale prices in State proceedings. TELRIC is merely one type of forward-looking cost analysis.

An alternate validation is provided in a recent decision by the Massachusetts Department of Telecommunications and Energy.⁷² Under the Department's assumptions, the difference in retail and wholesale costs for a Total Service Resale ("TSR") line is 25.51%.⁷³ For a TSR line, however, the BOC incurs costs that are not born for a UNE-P line. For example, access charges are paid by the CLEC for a UNE-P line, whereas those charges are paid by the ILEC for a TSR line. Also, operator services may be provided by a third-party vendor for UNE-P lines, so these costs may be avoided for UNE-P even though incurred for a TSR. If access charges and operator service expenses are (properly) considered avoided for a UNE-P customer, then the avoided retail costs in Massachusetts are 46.5% of retail expenses.⁷⁴ Including operator services lowers the difference to 41.3%. From Table 5, the wholesale costs computed using the methodology described in this paper renders a difference between wholesale and retail expenses for Verizon of 47.3%. Obviously, these wholesale-retail cost differences are very similar, and provide further validation of the reasonableness of our calculations and estimates.

VII. Conclusion

Recent reports on the financial consequences of UNE-P sales for Bell Operating Companies have drawn additional attention to long-standing complaints by the BOCs that such sales are confiscatory, and amount to "subsidized competition." Of course, no one expects incumbent firms to support any sort of unbundling at prices that a competitor would be willing to pay. Nevertheless, there is an important distinction between mandated unbundled element sales that are unwelcome, and mandated sales that actually threaten the viability of the incumbent providers. The BOCs' complaints establish that unbundled element sales are unwelcome, but not that they are, in any relevant sense, "below cost."

A number of recent financial studies find that mandated UNE-P sales produce losses for the incumbents, and that these losses, despite long-standing claims about the excessive profitability of long distance markets, are not offset through in-region, long distance operations permitted under the Section 271

⁷² Order on Verizon Massachusetts' Compliance Filing, DTE 01-20-Part A-B (May 29, 2003), Appendix A.

⁷³ The Department ordered a TSR discount of 25.51%, whereas Verizon proposed a TSR discount of 22%. *Id.*

⁷⁴ Because revenues from operator services are excluded,

process. The financial analyses by Merrill-Lynch, UBS, and others described in this paper, however, are designed specifically to provide investment advice and, as such, are not useful for evaluating the social impacts of required element sales. Indeed, from the investor's point-of-view, a firm that gained a monopoly might represent an excellent opportunity, although it is incorrect to argue from these premises that society should welcome such a development. On the other hand, financial analyses do serve a useful purpose, and the survival of the Bell companies is presumably a matter of concern for regulators and the public, as well as Wall Street.

This paper subjects the conclusions of these financial studies to careful scrutiny, and finds that they are largely without merit. Errors in both the calculation of unbundled element revenues, and in the wholesale costs of providing unbundled elements, are identified. Using actual payments by a representative CLEC, we find that revenues ordinarily reported in financial analyses are substantially understated. These understatements arise from several sources, including omission of certain nonrecurring charges, incorrect assumptions on the mix of loops purchased by competitors, and so on.

On the cost side, the publicly available ARMIS data can be used to construct measures of current costs for wholesale element sales in a manner conceptually consistent with Bell protestations on these matters. While such costs are not economic costs, neither are they hypothetical, but instead they represent costs incurred by the incumbents and, therefore, are relevant for financial analyses of the type under discussion. We carefully obtain realistic cost figures usable for financial analyses. We do not use TELRIC costs, nor do we seek to identify the costs of efficient forward-looking network operations.

Our analysis suggests that positive gross and net margins are the rule when costs and revenues are aggregated to the level of the BOC. Even the inclusion of depreciation and a return to capital does not materially alter this conclusion – UNE-P is *profitable* to the BOCs.

Concerns over the profitability of unbundled element sales reflect a widespread recognition that such sales are less profitable than an indefinite retention of monopoly power. While the BOCs would surely be better off if they were not required to accommodate competition (for a variety of reasons), the emergence of effective competition in local markets is the primary policy goal of

the Telecommunications Act of 1996.⁷⁵ Regulatory actions that derail the unbundling process are tantamount to abandonment of the goals of the Act. In fact, declining margins are a hallmark of competition and a signal that the Act's implementation is promoting the desired effects.

Updated June 23, 2003.

We appreciate helpful comments from others who have replicated our results. The following corrections to the model were made: 1) An incorrect adjustment to BellSouth's operating expenses was eliminated, raising BellSouth's operating expenses by \$0.69 per line. 2) Understatement of retail avoided expenses due to formula error, the repair of which lowered operating expenses by about \$0.08 on average (including BellSouth). All reported numbers have been adjusted to reflect these changes.

⁷⁵ See Preamble to the Conference Report to Accompany S. 652, H. Rpt. 104-458, 104th Cong., 2d Sess. (1996) ("provide for a pro-competitive, de-regulatory national policy framework").